6000 Base Unit

Portable, modular platform designed for the construction, validation and maintenance of optical fiber networks

User Manual

JDSU

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Manual This guide is a product of JDSU's Technical Information Development Department. This manual gives you the main information to install, start and use the 6000 Base Unit.

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About this guide

The 6000 Base Unit of JDSU provides a portable, modular platform designed for the construction, validation and maintenance of optical fiber networks.

The topics discussed in this chapter are as follows:

– “Purpose and scope” on page xiv
– “Assumptions” on page xiv
– “Technical assistance” on page xiv
– “Conventions” on page xv

Purpose and scope

The purpose of this guide is to help you successfully use the Platform 6000 features and capabilities. This guide includes task-based instructions that describe how to install, configure, use, and troubleshoot the Platform 6000. Additionally, this guide provides a complete description of JDSU's warranty, services, and repair information, including terms and conditions of the licensing agreement.

Assumptions

This guide is intended for novice, intermediate, and experienced users who want to use the Platform 6000 effectively and efficiently. We are assuming that you are familiar with basic telecommunication concepts and terminology.

Technical assistance

For America TAC #s and hours of operation, delete those numbers that are not applicable to your product line.If you need assistance or have questions related to the use of this product, call or e-mail JDSU's Technical Assistance Center for customer support.

Table 1 Technical assistance centers

Region	Phone Number	
Americas Telecom Products	866 228 3762 World Wide: 301 353 1550	tac@jdsu.com
Europe, Africa, and Mid-East	+49 (0) 7121 86 1345 (Europe)	hotline.europe@jdsu.com
	+33 (0) 1 30 81 50 60 (JDSU France)	support.france@jdsu.com

Table 1 Technical assistance centers (Continued)

Region	Phone Number	
Asia and the Pacific Southeast Asia, Australia, and New Zealand	+852 2892 0990 (Hong Kong) +86 10 6833 7477 (Beijing-China)	
All others	866 228 3762	tac@jdsu.com

During off-hours, you can request assistance by doing one of the following:

- leave a voice mail message at the Technical Assistance number in your region
- e-mail North American Technical Assistance Center, tac@jdsu.com, or European Technical Assistance Center, support.uk@jdsu.com
- submit your question using our online Technical Assistance Request form at www.jdsu.com.

Conventions

This guide uses naming conventions and symbols, as described in the following tables.

Table 2 Typographical conventions

Description	Example
User interface actions appear in this **typeface**.	On the Status bar, click **Start**.Use the Direction character tag for this convention.
Buttons or switches that you press on a unit appear in this **TYPEFACE**.	Press the **ON** switch.Use the Switch character tag for this convention.
Code and output messages appear in this `typeface`.	`All results okay`

Table 2 Typographical conventions (Continued)

Description	Example
Text you must type exactly as shown appears in this `typeface`.	Type: `a:\set.exe` in the dialog box the CodeDirection character tag for this convention.
Variables appear in this ***typeface***.	Type the new ***hostname***.Use the Emphasis character tag for this convention.
Book references appear in this ***typeface***.	Refer to ***Newton's Telecom Dictionary***
A vertical bar | means "or": only one option can appear in a single command.	`platform [a|b|e]`
Square brackets [ ] indicate an optional argument.	`login [platform name]`
Slanted brackets < > group required arguments.	<`password`>

Table 3 Keyboard and menu conventions

Description	Example
A plus sign + indicates simultaneous keystrokes.	Press **Ctrl+s**
A comma indicates consecutive key strokes.	Press **Alt+f,s**
A slanted bracket indicates choosing a submenu from menu.	On the menu bar, click **Start > Program Files**.

Table 4 Symbol conventions

	This symbol represents a general hazard.

This symbol represents a risk of electrical shock.

NOTE

This symbol represents a Note indicating related information or tip.

Table 5 Safety definitions

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

Introducing the 6000 Base Unit

1

The JDSU 6000 Base Unit is a portable, modular platform designed for the construction, commissioning and maintenance of fiber optic networks.

The topics discussed in this chapter are as follows:

– “Terminology used in this manual” on page 2
– “Laser safety” on page 2
– “AC/DC and battery important safety instructions” on page 4
– “User interface” on page 5
– “Technology” on page 6
– “Mechanical strength” on page 6
– “The modules is very simple to install, requiring only a screw driver.” on page 6
– “Measurements” on page 7

Terminology used in this manual

To designate the modules making up the 6000 Base Unit, the following conventions have been adopted:

– Plug-in — designates an element that can be plugged into a 6000 Base Unit (test plug-ins: OTDR, CD, PMD, WDM, etc.).

Fig. 1 Designations of sub-assemblies of the 6000 Base Unit

Laser safety

The provisions contained in two standards define the safety procedures to be observed both by users and by manufacturers when utilizing laser products:

– EN 60825-1: 2001 - Safety of laser products – Part 1: Classification of products, requirements and user guidelines.
– FDA 21 CFR § 1040.10 - Performance standards for light-emitting products - Laser products.

Due to the range of possible wavelengths, power values and injection characteristics of a laser beam, the risks inherent in its usage vary. The laser classes form groups representing different safety thresholds.

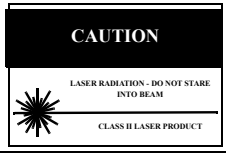
Laser classes

Standards EN 60825-1, Edition 1.2, 2001-08 and FDA21CFR§1040.10:

- Talkset option: Class 1.
- VFL option: Class 2.

Warning labels for the laser classes

Due to the reduced dimensions of the optical modules, it is not possible to attach the required warning labels to them. In line with the provisions of Article 5.1 of the EN 60825-1 standard, the laser class identification labels are shown below:

Reference standard	EN 60825-1, Edition 1.2, 2001-08	FDA21CFR§1040.10
Class 1		
Class 2		

The user must take the necessary precautions concerning the optical output of the instrument and follow the manufacturer's instructions.

Measurements on optical fibers are difficult to execute and the precision of the results obtained depends largely on the precautions taken by the user.

AC/DC and battery important safety instructions

In conformance with the recommendations of standard EN 61010, the instrument should be operated within the manufacturer's guidelines. Failure to do so may compromise the protection offered by the instruments design.

The 6000 Base Unit is supplied with a Lithium Ion (LiIon) or nickel-metal hybride (NiMH) rechargeable battery .

Do not use any mains adaptor or battery other than those supplied with the instrument, or supplied by JDSU as an option for this instrument.

The battery supplied by JDSU incorporates protection means.

If another adapter or battery is used, it may damage the 6000 Base Unit itself. Using the 6000 Base Unit with another battery than the one supplied by the manufacturer of the 6000 Base Unit may entail risks of fire or explosion.

– The battery may explode, leak or catch fire:
  - if it is exposed to high temperature or fire
  - if it is opened or dismantled.

Other basic safety precautions are as follows:

– Do not use AC/Adapter/Charger outdoors or in wet or damp locations
– Connect the AC/Adapter/Charger to the correct mains voltage, as indicated on the ratings label.
– This product is intended to be used with a 3-wire grounding-type plug (a plug that has a grounding pin). This safety feature is vital to the safe operation of the instrument. Do not defeat the purpose of the grounding-type by modifying the plug or using an adapter.
– Do not allow anything to rest on the power cord, and do not locate the product where people can walk on the power cord.
– Avoid using this product during an electrical storm. There may be a remote risk of electric chock from lightning.
– Do not use this product in the vicinity of a gas leak or in any explosive environment.

– Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous, high voltage points and other hazards. Contact qualified service personnel for all service.

–

SAFETY: Battery disposal

Your system use a a lithium ion (LiIon) or a nickel-metal hybride (NiMH) battery pack and a lithium coin-cell. These are long-life batteries, and it's possible that you will never need to replace them. However, should you need to replace them, refer to your system documentation for instructions.

Do not dispose of the battery along with household waste. Contact your local waste disposal agency for the address of the nearest battery deposit site.

Recycling Information

JDSU recommends that customers dispose of their instruments and peripherals in an environnmentally sound manner. Potential methods include reuse of parts or whole products and recycling of products, components, and/or materials.

Waste Electrical and Electronic Equipment (WEEE) Directive:

In the European Union, this label indicates that this product should not be disposed of with household waste. It should be deposited at an appropriate facility to enable recovery and recycling.

User interface

The 6000 Base Unit is equipped with:

– a 8.4 inch TFT color screen, high visibility (optimized for outdoor use), which can be touchscreen on option.
– hard keys or tactile keys (option)
– numerous functions such as Fault Locator VFL (Visual Fault Location), source power meter, optical microscope, talkset, etc.
– remote front panel function, data transfer, etc.

The particularly simple user interface means familiarity with the instrument is quickly attained. This interface remains the same, irrespective of the options and the module with which the instrument may be equipped.

An external keyboard and a mouse (on option) facilitate data input.

Technology

The 6000 Base Unit employs multi-tasking for the simultaneous performance of several operations (such as acquisition, modification of parameters, trace analysis, printing) and several functions (for example OTDR and power meter).

The measurement results can be stored in the internal memory (32 Mbytes), or on the following options:

– internal memory extension (1 Gbytes),
– plug-in media (USB memory key).

Mechanical strength

Although it is extremely light, the housing of the 6000 Base Unit can resist harsh environmental conditions:

– its rubber protectors give it high shock resistance
– it resists water splashes.

The module is very simple to install, requiring only a screw driver.

Software

The software can be easily updated from the Ethernet interface or from a USB key.

Measurements

The 6000 Base Unit can be used to test fiber optic networks:

– during the phase of design and production of equipment
– during the phase of installation and validation of such equipment in a network
– during the phase of network maintenance.

Starting up

2

This chapter explains the operations to be carried out before using the 6000 Base Unit.

The topics discussed in this chapter are as follows:

– “Unpacking the instrument” on page 10
– “Installing and removing a plug-in unit in the 6000 Base Unit” on page 10
– “Choosing the position of the instrument on the work surface” on page 11
– “Battery management” on page 13
– “Switching the 6000 Base Unit on and off” on page 16
– “Presentation page of the 6000 Base Unit” on page 17
– “Troubleshooting” on page 18

Unpacking the instrument

Remove the 6000 Base Unit and its accessories from the packing case. Check that the module and accessories ordered are all there.

If any part is missing or damaged please contact your local JDSU agent.

The 6000 Base Unit is delivered with the following accessories:

– a user manual
– a mains adapter used for mains operation of the instrument and battery charging.
– a soft carrying case (option)
– a hard carrying case (option)

Installing and removing a plug-in unit in the 6000 Base Unit

Fig. 2 Plug-in set in the 6000 Base Unit

Removing a plug-in

The 6000 Base Unit must be switched off and, if it is operating on the mains, its supply cable must be unplugged.

1 Unscrew the two captive fixing screws of the plug-in completely (up to the stop).

2 Carefully slide the plug-in out of its slot.

Inserting a plug-in unit into the 6000 Base Unit

The 6000 Base Unit must be switched off and, if it is operating on the mains, its supply cable must be unplugged.

1. Slide the plug-in into its slot.
2. When the plug-in is fully home, press firmly on the screen-printed face of the plug-in while tightening the clamping screws. The screen-printed face of the plug-in must be flush with that of the 6000 Base Unit.
3. Make sure that the two large captive screws of the plug-in are screwed fully home.

Choosing the position of the instrument on the work surface

Depending on the conditions of use of the 6000 Base Unit, the instrument may be placed on a flat surface or held in the hand.

When used on a work surface, the 6000 Base Unit should be supported on its stay, which can be set in either of two positions, depending on whether the user is standing or sitting.

To change the stay from “seated user” position to “standing user” position, press both sides to slide the stay towards the upper end of its groove, as shown in the drawings below.

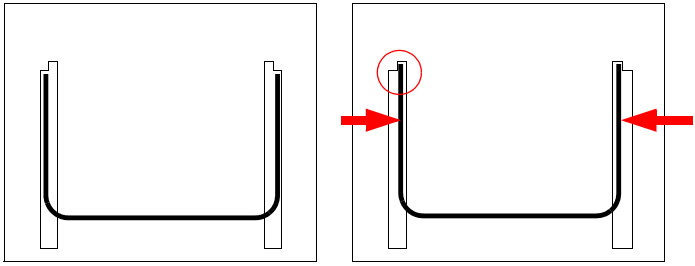


Fig. 3 Stay in positions for seated user and standing user

Fitting the carrying handle or strap

When the 6000 Base Unit is used hand-held, the carrying strap may be fitted instead of the handle.

The strap (or the handle) is fastened with quick-fitting attachments on each side of the modules.

– To fit a strap (or a handle), position each stud against the attachment point provided for the purpose on the sides of the cover, and press.
– To detach the strap (or handle) from the instrument, lift the stud away from its attachment to open the internal clip, and pull.

Fig. 4 Attachment of handle

Battery management

The battery supplied with the 6000 Base Unit must be fully charged before use.

The instructions below apply either for a **Lithium Ion (Lilon) or nickel-metal hybride(NiMH)** battery, installed into the instrument.

Charging the battery

Connecting the mains adapter

Use only the mains adapter supplied with the 6000 Base Unit. The adapter for some other electronic device may appear to be identical, but entails a risk of damage to the 6000 Base Unit.

– At the top of the 6000 Base Unit (upper left-hand corner), lift up the power supply socket protector and plug in the mains adapter.
– Connect the adapter to the mains. The **On/Off** indicator lamp starts to blink.

Charging

If the instrument is fitted with a battery, on connection to the mains:

– if the user does not press **ON** within 30 seconds, the battery will go on to rapid charge.
– if the user presses the **ON** key before rapid charge begins, the instrument starts up and the battery will be charged at low rate during use.
– In both cases, the charge indicator will go on during charging.

It is essential to wait until charging is complete to ensure maximum independent operating time, which may otherwise be considerably reduced.

Lithium Ion Battery charging time

If the battery is completely discharged, the time taken to recharge may be:

– approximately 3 hours, if the apparatus is not in use (**On/Off** indicator **off**)

– about 10 hours if the instrument is used during charging (**On/Off** indicator **on**).

Lithium Ion Battery endurance

Conditions of use	Endurance
Normal operation, with low backlight strength, in accordance with Bellcore/Telcordia recommendation GR-196-CORE, SR type OTDR plug-in (12 acquisitions of 30 s per hour, and auto-off))	up to 10 hrs.
Operation with low backlight strength, in accordance with Bellcore/Telcordia recommendation GR-196-CORE (12 acquisitions of 30 s per hour, no auto-off	up to 6 hrs.
Under continuous measurement, with SR type OTDR module: - with normal screen backlight strength - with high screen backlight strength	 5 hrs. 3.5 hrs.

Charge and On indicators

– **On** indicator blinking: the instrument is switched off but connected to an external power source.

– **On** steady: the instrument is operating, either on batteries or an external power source.

– **Charge** indicator on: the instrument is connected to an external power source and the battery is on charge.

Battery charge level display

When the battery is installed in the instrument, its charge level is displayed in green in a graphic in the top left-hand corner of the screen and also as a charge percentage. Example: 100% .

It is essential to wait until charging is complete for maximum battery endurance, otherwise this may be considerably reduced and the level of charge may not be correctly displayed.

– If the battery charge level is too low (less than 10%), a message is displayed. In this situation, results must be stored and the 6000 Base Unit switched off (**ON/OFF** button).

– When the battery charge level drops below 5%, an audio signal is emitted at intervals and an exclamation point is displayed next to the icon . When the level becomes too low, the instrument switches off automatically after saving the current configuration.

Access to the battery

– Switch off the 6000 Base Unit and disconnect the mains supply.
– Turn the instrument face down on the work surface.
– Slacken the screws located at the bottom of the instrument using a coin, and unscrew them
– Remove the cover of the battery pack.

  The battery can then be removed, taking care not to damage the connectors into which it is plugged.

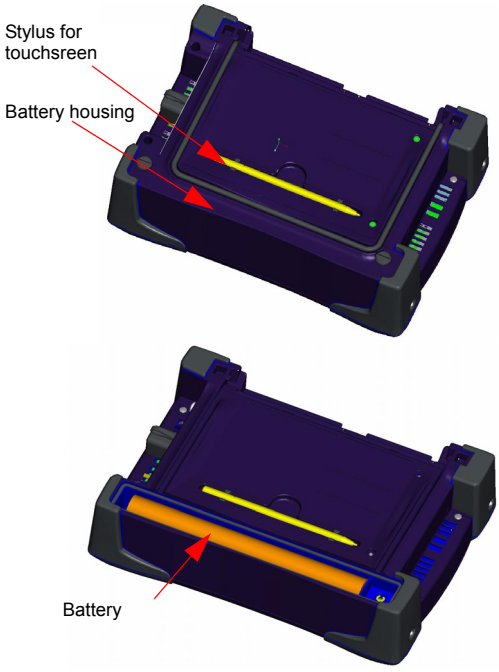


Fig. 5 Battery seatings

When putting the battery back into its seating, make sure that its connector engages correctly with the one of the 6000 Base Unit. Then fit the cover back and lock the screws.

Safety recommendations

The Lithium Ion battery is designed for maximum safety. In particular, each cell is provided with a safety valve to prevent excessive internal pressure in the event of overcharging or exposure to very high temperatures.

Use only the battery supplied with the 6000 Base Unit. Batteries supplied with other electronic devices may appear to be identical, but entail a risk of damage to the 6000 Base Unit.

If you do not intend to use the 6000 Base Unit for several weeks, it is advisable to remove the battery in order to prolong its useful life, and to recharge it fully before using it again.

Switching the 6000 Base Unit on and off

The mains adapter is used not only for charging the battery (if the battery pack is installed), but also for operating the 6000 Base Unit on the mains, if a mains socket is at hand, to save the battery.

Switching on

Switching on using the battery

– Press the **ON/OFF** key. The **On** indicator lights up.
– The JDSU logo appears on the screen briefly, then an autotest is carried out, the software is installed (this just takes a few seconds), then the screen goes dark for about three seconds. Finally the opening screen appears (see "Presentation page of the 6000 Base Unit" page 17).

Mains operation

If the instrument is to operate on the mains:

– lift the protective cover over the power supply socket on the top of the 6000 Base Unit (top left-hand corner) and plug in the mains adapter.The JDSU logo shows briefly and is followed by an autotest. Then the **On** indicator starts to blink: the instrument is ready to start up.
– press the **ON** key (if this is not done, and the instrument is equipped with a battery, it will switch over to rapid charging of the battery after about 20 seconds).

NOTE

It is possible to switch over from battery to mains operation, or vice versa, without loss of data.

In the event of an unexpected mains power cut, if there is no battery, the current results and configuration will not be saved. Next time the instrument is switched on, it will return to its initial configuration.

Switching off the 6000 Base Unit

While the 6000 Base Unit is operating, press the **ON/OFF** button to switch it off.

NOTE

When the instrument is switched off using the **ON/OFF** button, current results and configuration are saved. Next time the **ON/OFF** key is pressed, they are recalled.

NOTE

With mains, wait for the message «It is now safe to unplug external power» or for the black screen before unpluging the main plug.

Reset

If the 6000 Base Unit freezes, prolonged pressure (about 4 s.) on the **ON/OFF** key will reset the instrument.

Presentation page of the 6000 Base Unit

The presentation page of the instrument is called up by pressing the **SYSTEM** button, followed by **Page Help**. It also appears when the instrument is switched on.

This page shows:

1 the version of the software installed in the instrument,

2 the hardware options: internal memory extension, talkset, power meter, VFL. Those that are installed in the instrument are marked with a green tick.

3 the module installed (including serial number and date of last calibration).

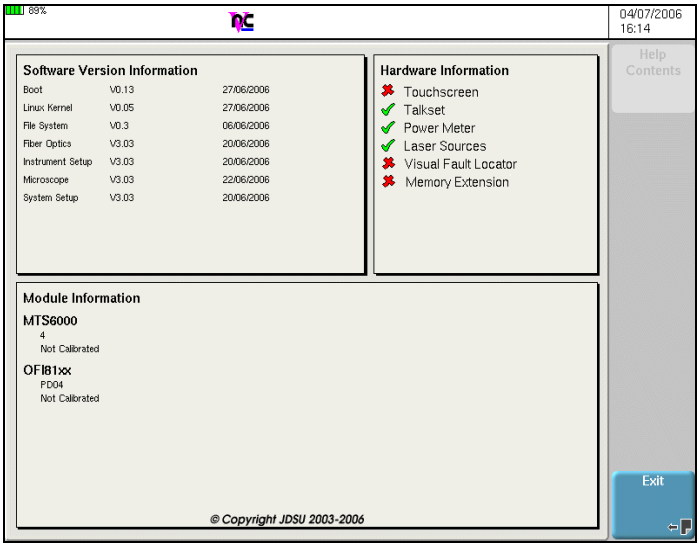


Fig. 6 Example of presentation screen

Troubleshooting

Troubleshooting	Solution
Nothing happens when the **ON/OFF** key is pressed.	Make sure that an internal battery is present or the mains adapter is properly connected.
You are using the 6000 Base Unit in the ordinary way when it suddenly switches off.	The parameters of the instrument may have been set so that it switches off automatically after 5 minutes of inactivity to save the battery. Work in progress is first saved in the memory. See ."Screen saver" page 41 Otherwise, check the battery charge level.

Troubleshooting	Solution
The battery refuses to charge (the charge indicator does not go on when the instrument is connected to the mains and is not operating).	There is no battery in the instrument, or the battery is already fully charged.

Controls of the 6000 Base Unit

3

This chapter describes the controls of the 6000 Base Unit.

The topics discussed in this chapter are as follows:

– “Control interface” on page 22
– “Using an external keyboard, mouse and screen touch (options)” on page 25
– “Editing” on page 27
– “Accessing the 6000 Base Unit from a PC” on page 31
– “Connectors” on page 34

The 6000 Base Unit is a multi-tasking instrument: the user can simultaneously carry out an acquisition, modify the configuration parameters, print out results and access the directory of the internal memory. In some cases, it is even possible to perform several measurement operations at the same time, but only the result of the function selected can be displayed.

Control interface

The 6000 Base Unit embodies the controls and display needed for measurement analysis:

- the display screen, with the associated menu keys on the right.
- the **ON/OFF** button and the operating and battery charging indicators.
- the general control buttons:
  SYSTEM / **SETUP** / **FILE** / **RESULTS**
- the measurement control keys:
  START/STOP & **SCRIPT**
- testing indicator
- direction keys for scrolling through the menus and the central button for selection/confirmation.

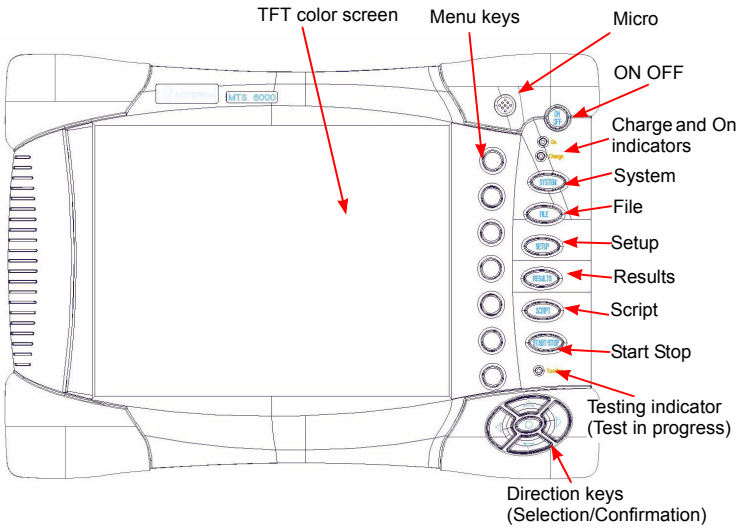


Fig. 7 Controls of the Interface module

TFT display screen

The 6000 Base Unit has a large, 8.4 inch TFT color screen, SVGA definition (800 x 600 pixels), back-lit:

- a high visibility TFT screen, for best visibility outdoors and indoors.

The high visibility screen supplied may also be a touch screen (option).

The different zones of the screen

The display is divided into 3 zones:

1 the central zone, displaying the configuration or the results of measurements.

2 at the top, in the status bar, in the form of icons:

– battery charge level (see "Battery charge level display" page 14)

– if visual fault location (VFL) is activated, the icon .

– if data saving is in progress, the icon .

– if the talkset is activated, the icon .

– current date and time.

3 at the side, rigid function keys (or tactile on option).

Control buttons

The buttons on the right of the 6000 Base Unit provide the following functions:

ON OFF

Main on/off switch

SYSTEM

This button gives access to:

– selection of the different measurement or base functions

– the configuration menus of the instrument (choice of function(s) used), When the instrument is switched off, its configuration is stored in the memory, as are the measurement results.

– the configuration menus of the system (screen, date, language, print-out, etc.).Once you have pressed the **System Setup** key, you can select:
  – the display parameters: screen illumination, automatic shut-down.
  – the parameters specific to the country of use: date, time, format of date/time, language.
  – the input/output parameters: Ethernet, Modem, e-mail configuration.
  – the validation of the loudspeaker
  – the initialization of automatic shutdown of the instrument.

For a complete description, see "System set-up" page 37.

NOTE

The configuration menus can be displayed, and modified if required during acquisition or measurement.

SETUP

This button calls up the measurement configuration menu. This menu depends on the function in use.

RESULTS

This button calls up the results page (e.g. with OTDR module: reflectometry trace, results and table of results) and is used to analyze results.

FILE

This button calls up the file and directory management menu.

It allows to:

– to choose the storage medium: internal memory, USB memory key; file name and format; information relating to the data stored in the file.
– to store files or retrieve them for selection, copying or deletion; with facilities for classifying them in directories and sub-directories.

START/STOP

Starts and stops the measurement.

SCRIPT

Is used to enter a sequence of commands and execute it.

NOTE

All these functions (except **SYSTEM**) depend on the module used and the measurements made: refer to the user manuals of the modules and plug-in measurement units of the 6000 Base Unit.

Indicators

On/Off - **blinking**: the instrument, though connected to an external power source, is switched off.

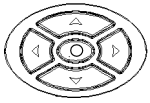
- **on**: the instrument is operating, either by battery or on an external power supply.

Charge **on**: the instrument is connected to an external power source and the battery is on charge.

Testing **on**: at least one function is in measurement phase (for example, the laser emission pilot for an OTDR measurement).

Direction keys

The direction keys have two principal functions:



– on the Results page, they are used to move the cursors or modify the zoom factor.

– on the set-up pages, they are used to scroll through the menus, the central button serving to select or confirm the parameter chosen.

Using an external keyboard, mouse and touch screen (options)

The external keyboard facilitates input of:

– alphanumerical configuration parameters
– comments in the File menu
– notes in the table of results
– editing characters

The mouse can be used instead of the direction keys to scroll through menus and make a selection.

Connect the keyboard and mouse to the USB connectors.

Virtual control buttons bar

It is possible to emulate hard keys with Virtual Control buttons

To display these buttons, click once on the top of the screen in the status bar, at the same height than the date and time.

Fig. 8 Virtual control buttons bar

The virtual control buttons bar is displayed during a few seconds. You may click on any of these buttons to obtain exactly the same results than using the real buttons in the front panel of the 6000 Base Unit.

The virtual control buttons bar can not be displayed within desktop applications (see Chapter 8 “Desktop applications” page 81).

NOTE

This virtual control buttons bar is especially useful when the 6000 Base Unit screen is exported on a remote PC (see "Transfer of the interface of the 6000 Base Unit onto a PC" page 33).

Equivalence between external keyboard and 6000 Base Unit

Although it is intended primarily to replace the Edit menu of the 6000 Base Unit, the external keyboard can replace all the buttons and keys of the 6000 Base Unit except the **ON/OFF** button**:**

- The menu keys to the right of the screen are replaced by the function keys **F1** to **F7**.
- The buttons below the screen are equivalent to **Ctrl +** a letter (see table below).
- The direction keys have the same function on the external keyboard and on the 6000 Base Unit.

Function on the 6000 Base Unit	External keyboard
SYSTEM	Ctrl + Y
SET-UP	Ctrl + U
PRINT	Ctrl + P
FILE	Ctrl + F
RESULTS	Ctrl + R
START/STOP	Ctrl + S
SCRIPT (Macro)	Ctrl + M
◀ ▲ ▶ ▼	← ↑ → ↓
Menu keys 1 to 7 (from top to bottom)	F1 → F7
SAVE AND QUIT (EXIT)	Entrée/Enter
QUIT WITHOUT SAVING (ABORT)	Escape/Echap.

Editing text using the external keyboard

To use the external keyboard to insert a name or identification in the set-up menus, or a Note in the table of results:

– press **Enter** to go into the Edit menu
– type the text
– press **Enter** to leave the Edit menu.

Pressing the **Esc** key will close the Edit menu without saving the text.

Editing[1]

In the set-up menus, it is sometimes necessary to enter alphanumerical information for names of files or results or for comments.

To call up the Edit menu, select the name to be modified, then press the ▶ key. The Edit menu will appear.

1.If an external keyboard is used, see "Using an external keyboard, mouse and screen touch (options)" page 25

This menu can be used to simulate a keyboard: it displays available characters and function keys. Some Edit menus may include keys specific to the current function.

The name to be modified is displayed above the keyboard. The can be moved about over the name to be modified and the characters available, using the direction keys or a mouse or an external keyboard: see "Using an external keyboard, mouse and screen touch (options)" page 25.

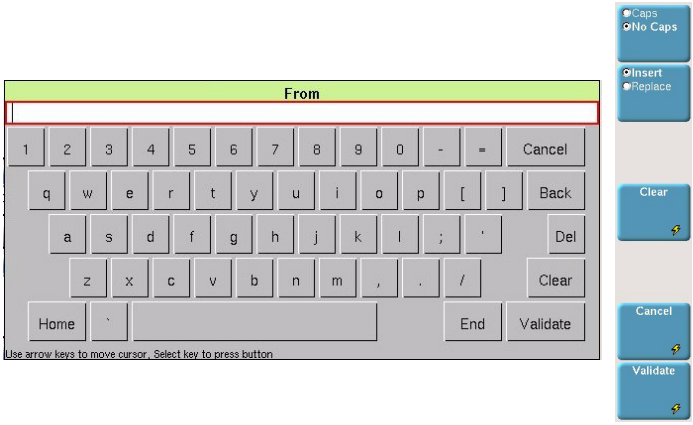

Caps
No Caps
Insert
Replace
Clear
Cancel
Validate
From
1 2 3 4 5 6 7 8 9 0 - = Cancel
q w e r t y u i o p [ ] Back
a s d f g h j k l ; ' Del
z x c v b n m , . / Clear
Home ` End Validate
Use arrow keys to move cursor, Select key to press button

Fig. 9 Example of Edit menu

– The **Caps/No Caps** key enables the keyboard to type either upper case letters or lower case letters and figures (as well as punctuation marks and certain special characters).

– The **Insert/ Replace** key selects the action which will be performed by the confirm key : either insertion of the character selected by the position of the cursor, or replacement of the highlighted character, by the character selected.

– Using the keyboard, with the cursor positioned on the name:
- confirming **DEL** deletes the character after the cursor;
- confirming **CLEAR** deletes all characters from the edit line;
- confirming **BACK** deletes the character before the cursor;
- confirming **HOME** moves the cursor to the beginning of the word;
- confirming **END** moves the cursor to the end of the word.

– The **Validate** key saves the name that has been entered and quits the Edit menu.

– The **Cancel** key quits the Edit menu without saving any changes that may have been made.

To enter text:

– Press the **Caps/No Caps** key, depending on the case of the character to be entered.

Without Touch Screen	Using Touch Screen
- Using the direction keys, move the cursor onto the first character required. - Press the validation key. The character will appear in the upper box. - Repeat the process for the remaining characters.	- Directly click onto the character you want. The character will appear in the upper box. - Repeat the process for the remaining characters.

To delete characters in a text:

Without Touch Screen	Using Touch Screen
- Go into **Replace** mode and move the cursor on to the character to be deleted. - Move the cursor on to **Back** (or **Del**) and press the validation key. Repeatedly pressing this same key will delete the preceding (or following) characters.	- Go into **Replace** mode and position the cursor on to the character to delete. - Click on the **Back** touch (or **Del**) Repeatedly clicking on this same key will delete the preceding (or following) characters

To insert characters in a text:

Without Touch Screen	Using Touch Screen
- Go into **Insert** mode and place the cursor on the name at the insertion point. - Using the direction keys, move the cursor on to the first character to be inserted. - Press the validation key. Repeat the process for the other characters to be inserted.	- Go into **Insert** mode and place the cursor on the name at the insertion point. - Directly click on the character you want Repeat the process for the other characters to be inserted.

Quitting the Edit menu

– Press the **Cancel** key to quit without saving the action performed (onto the keyboard or the screen).

– Press the **Confirm** key to quit the menu while saving the text entered (onto the keyboard or the screen).

Numeric Keypad

For some configuration parameters, you will have to enter numeric values. The direction keys of the 6000 Base Unit can be used. However, the user can also use the numeric keypad, displayed when the **Edit Number** key is pressed.

Click on Edit Number to display the Numeric Keypad.

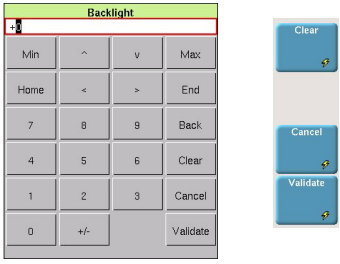


Fig. 10 Example of Numeric Keypad

The keys **Min** and **Max** are displayed when the parameter has a minimum and maximum value (for example, for the screen lighting level, pressing the **Min** key will display the value -5 and pressing the **Max** key will display the value +5).

The direction keys ⋀ ⋁ allow to increment of +/-1 the selected value.

The direction keys < > allow to select the previous or the next figure.

Clear key: delete all the displayed value (same function as the Clear key of the screen)

Cancel key: quits the Edit Number menu without saving any changes that may have been made (same function as the Cancel key of the screen)

Validate key: saves the name that has been entered and quits the Edit Number menu (same function as the Validate key of the screen).

Modifying / Changing a value with the numeric keypad

When the Edit Number menu is opened, the first figure of the value is selected.

Without Touch Screen	Using Touch Screen
- Move the cursor to the first number to be inserted. - Press the validation key. Repeat the process for the other characters to be inserted.	- Directly click on the number to be inserted Repeat the process for the other characters to be inserted.

Accessing the 6000 Base Unit from a PC

The 6000 Base Unit can be connected to a PC in order to:

– remote the screen of the 6000 Base Unit on to the PC and issue commands from the keyboard of the PC
– access the internal memory of the 6000 Base Unit from the PC and transfer files from the 6000 Base Unit to the PC and vice versa.

Connecting the 6000 Base Unit to a PC

NOTE

The Ethernet card of the equipment connected to the 6000 Base Unit must be configured to the Auto-detect mode (Auto negociation).

Direct connection

1 **On the PC**: find the IP address and the mask of the PC's sub-network:

– With Windows 98 or Millenium: Select **Start > Execute**, then enter `winipcfg`[2] and click on **OK**.

– With Windows NT, 2000 or XP: select **Start > Programs > Accessories > Dos Prompt**, type `ipconfig`[1], then **Enter**.

Note the IP address and the mask of the PC's sub-network.

2 **On the** 6000 Base Unit:
In the system set-up menu, under **I/O interface > Ethernet**, enter:
- an IP identical to that of the PC +/- 1; for example, `10.10.50.204` if the address of the PC is `10.10.50.203`.
- the IP mask of the PC,
- an IP gateway resembling the IP address, for example, ending with the character 1.

3 Connect the RJ 45 connector of the 6000 Base Unit to that of the PC with a crossover Ethernet cable.

4 Wait for about ten seconds while the connection is established.

5 On the PC, make sure that the connection is operational by selecting **Start > Execute...** and typing `ping` followed by the address of the 6000 Base Unit.

Connection via a local network

1 **On the PC**: find the IP address and the mask of the PC's sub-network:

– With Windows 98 or Millenium: Select **Start > Execute**, then enter `winipcfg`[3] and click on **OK**.

– With Windows NT, 2000 or XP: select **Start > Programs > Accessories > Common line**, type `ipconfig`", then **Enter**.

Note the IP address and the mask of the PC's sub-network.

2.The character _ corresponds to a space.
3.The character _ corresponds to a space.

2 **On the** 6000 Base Unit:
In the system set-up menu, under **I/O interface > Ethernet**, enter the IP address, the IP mask and the IP gateway communicated to you by the network manager; or, on his recommendation, use dynamic attribution mode (DHCP). In this case, the address of the 6000 Base Unit (`10.10.50.204` in the example) is displayed but cannot be altered.

3 Plug the RJ 45 connector of the 6000 Base Unit into a hub or Ethernet switch with a straight-through Ethernet cable

4 Wait for about ten seconds while the connection is established.

5 On the PC, make sure that the connection is operational by selecting **Start > Execute...** and typing `ping` followed by the address of the 6000 Base Unit.

Transfer of the interface of the 6000 Base Unit onto a PC

1 Make the 6000 Base Unit / PC connection as described above.

2 **On the** 6000 Base Unit in the system set-up menu, under I/O interface, confirm **Remote screen = Session** or **Permanent** (for more information, see "Remote screen" page 43).

3 **On the PC**, go into Internet Explorer and type the address:
`http://10.10.50.204:5800`
if `10.10.50.204` is the IP address of the 6000 Base Unit that was defined when the connection was set up.

A VNC window will open demanding a password: press **Enter** without typing any password.

For an intensive use of the deport screen or when it is used via a WAN network, it is strongly recommended to use a dedicated VNC client. The VNC clients recommended are Tight VNC (V 1.2.9) and Real VNC (V 4.1.1).

The screen of your 6000 Base Unit will then appear on to your PC. You can use the keyboard and mouse of the PC to control the 6000 Base Unit: see "Using an external keyboard, mouse and screen touch (options)" page 25, for the command equivalents between the controls of the 6000 Base Unit and those of the PC keyboard and mouse.

Accessing the internal memory of the 6000 Base Unit via a PC

Il is possible to access the internal memory of the 6000 Base Unit from a PC by means of the FTP server of the 6000 Base Unit.

FTP access is obtained through the user accounts «mts6000» or «t-berd6000» (password: acterna).

1. Make the 6000 Base Unit / PC connection as described above.
2. On the PC, use either an FTP client or Internet Explorer.
3. In Internet Explorer, type the following address (`10.10.50.204`, which is the IP address of the 6000 Base Unit that was defined when the connection was set up):

   `ftp://mts6000:acterna@10.10.50.204/disk/`
   (access to internal memory of the 6000 Base Unit).

The PC then displays the contents of the internal memory of the 6000 Base Unit.

NOTE

Replace `ftp://mts6000:acterna` by `ftp://t-berd6000:acterna` to use the user t-berd6000 instead of mts6000.

Connectors

The rear panel contains, from left to right, the following elements (see example below):

- the connection plug of the mains adapter.
- USB connectors for printer, mouse, keyboard, USB memory key, etc.,

Only one USB memory key should be plugged in the unit at any one time.

If you wish to use a second USB key (even if it is from the same manufacturer), then you must fully reboot the unit. (i.e. power down and remove external power if it was present).

- the RJ 45 connector for the Ethernet interface,
- if the VFL option is present, the corresponding output
- if the Talkset option is present, the optical connector
- if the powermeter option is present, the corresponding input.

– if the Talkset option is present, the headset socket (jack-plug)

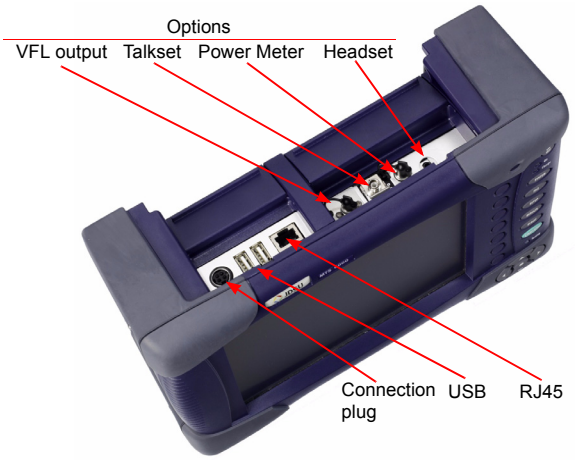


Fig. 11 Example of rear panel

System set-up

4

This chapter describes the operations for configuring the instrument (choosing the module or function to be used) and the system (date, language, input/output, etc.).

The topics discussed in this chapter are as follows:

– “Principle of the set-up menus” on page 38
– “Configuring the instrument” on page 38
– “Configuring the system” on page 40
– “Standalone results” on page 48
– “Expert Tools” on page 49
– “Desktop Applications” on page 49

The procedures described below usually use the direction keys. When the instrument is equipped with a mouse or/and a touch screen:

- the user must adapt the text to the option used; which means that for touch screen and mouse, the user must directly click on the desired field.

- to edit a string of characters, the ▶ key of the 6000 Base Unit must sometimes be used.

Principle of the set-up menus

A set-up can be displayed or modified while an acquisition or measurement is in progress. The parameters that cannot be modified are greyed out. The menu thus gives all the possible options, excluding numerical values.

– To move from one parameter to another, use the direction keys ▲ and ▼. When a parameter is selected, its possible values are shown to the right of the parameter.
– To modify the value of a parameter, use the direction keys ◀ and ▶ to highlight the option selected.
– To leave a set-up menu the user can press any of the keys below the screen or the menu key **Exit**.

Configuring the instrument

Since the instrument can integrate several functions onto a module, a variety of functions are possible. Before carrying out a particular measurement, it is therefore necessary to select the function or functions required for it

If a module has been changed, the instrument configuration menu will automatically be displayed as soon as the power is switched on.

To configure the instrument, proceed as follows:

– press the **SYSTEM** button.
The functions available on the instrument are represented graphically by icons.

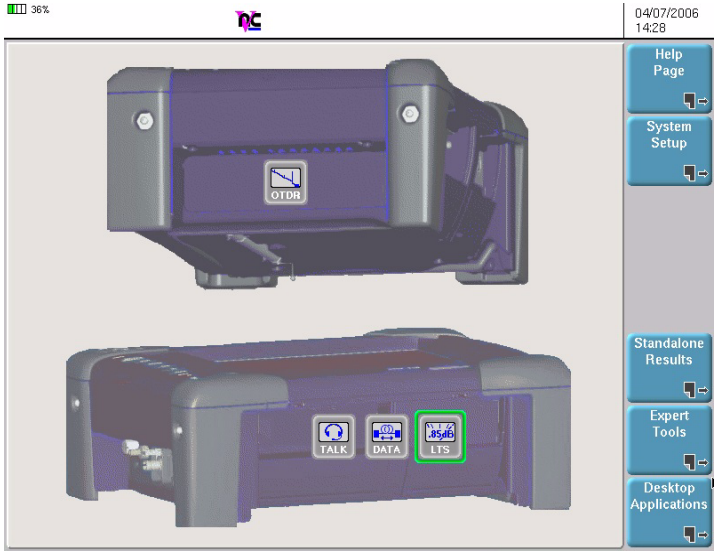


Fig. 12 Example of instrument configuration

To validate a function:

– Move on to the icon representing the function to be validated using the direction keys (or the mouse or external keyboard if the corresponding option is present).

– Press the validation key to confirm the selection. The icon turns red and is outlined with a bright frame.

Validating several simultaneous functions

It is possible to validate several distinct functions. Thus it is possible, for example, to activate the microscope function at the same time as the OTDR function by validating each of them.

When several functions are validated, pressing the keyboard keys (**SETUP**, **FILE**, **RESULTS**, **START/STOP**, **SCRIPT**) will give access to the function in focus (with green round its icon).

To change from one function to another:

– simply change tabs (refer to the manual corresponding to the application).

Use only the direction keys to move the focus on to the desired function. Do not use the validation key, which would have the contrary effect of de-activating the function.

Help The Help Page of the **SYSTEM** menu calls up the presentation page of the 6000 Base Unit (see "Presentation page of the 6000 Base Unit" page 17) and its electronic manual (future function).

Configuring the system

When the 6000 Base Unit is to be used for the first time, or before a measurement campaign is started, the parameters of the system must be configured:

– the parameters specific to the 6000 Base Unit (screen lighting level, automatic shutdown).
– the parameters specific to the country of use: language, date, time, display format of date and time.
– parameters of input/output.
– activation of loudspeaker and regulation of sound level (with Talkset option)
– programming of automatic shutdown (during battery operation).
– IP adress for upgrading via the network
– parameters for printing

To call up this configuration menu, press the **SYSTEM** button, then the menu key **System Setup.**

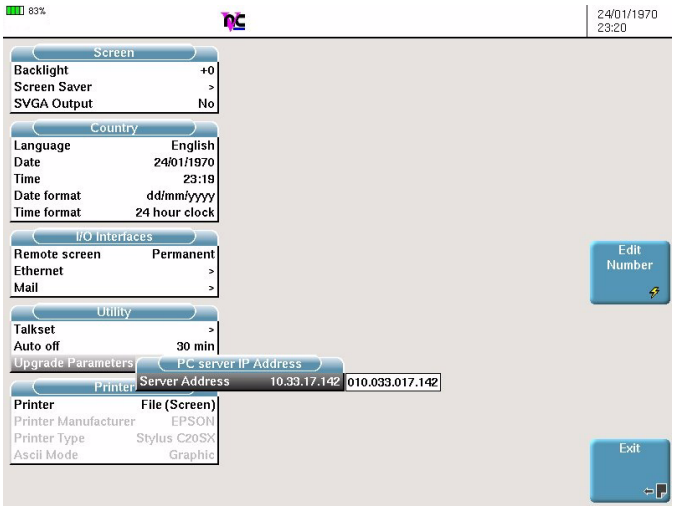


Fig. 13 System configuration screen

Screen Choosing screen lighting level

In the **Screen** window, move the cursor on to **Lighting**.

– use the direction keys → or ←, to choose the desired lighting level (between -5 and +5).

or

– click on **Edit Number** to enter the screen lighting level on the numeric keypad

If the 6000 Base Unit is operating on battery, it is advisable to choose a minimum lighting level acceptable for the user, to keep endurance as long as possible.

Screen saver

This feature is available both when battery powered or AC powered. Its purpose is to extend the life of the screen, in case the 6000 Base Unit is not used for some time. Instead of the normal screen, a small animated picture of the 6000 Base Unit is displayed on the blackened screen, eventually followed from time to time by a name and phone number.

Fig. 14 Screen saver displaying the factory name

To configure this feature, select **Screen Saver**.

A sub-menu is displayed :

Screen saver	60s, 3 min, 5 min, No. <No> disables the screen saver. Other values indicate time of inactivity before the screen saver automatically starts. If the screen saver is enabled (a time is set), the following two lines are proposed.
Name	A name or comment may be entered. This name or comment may be usefull to persons who find the 6000 Base Unit in the screen saver mode. Information such as who currently uses the apparatus, where to find the person or any other commercial information may be entered.
Phone number	A phone number or other comment may also be added in order to provide more information : number to call in case of emergency, user telephone number...

Country Choosing language (Language)

Select one of the languages offered, using the direction keys → or ← .

When the language is changed, the man-machine interface will only be in the language selected after the instrument has been switched off and restarted.

Resetting the date

Change the date by using the direction keys → or ← .

Resetting the time

– Use the direction keys → or ← to change the minutes and hours.

Choosing date format

Choose one of the options: dd/mm/yy or mm/dd/yy for the date format.

Choosing time format (Time Format)

Use the direction keys → or ← to change the hour format (12 hour clock / 24 hour clock)

I/O Interface

Remote screen

It is possible to remote the screen of the 6000 Base Unit on to a PC or on to another 6000 Base Unit and to read the contents of the disk of the 6000 Base Unit on a PC or on the other 6000 Base Unit. To do this, see ."Accessing the 6000 Base Unit from a PC" page 31

It is also possible to remote the screen of a distant 6000 Base Unit on to another 6000 Base Unit and to have full control of the distant instrument. To do this, see "VNC - remote screen" page 68.

Remote screen = Session or **Permanent** must be confirmed in both cases, in the Interface E/S window.

Session Mode	the Remote screen function is inactive once the 6000 Base Unit is switched off.
Permanent Mode	the Remote screen function is still active when the 6000 Base Unit is switched off and restarted.
No	the screen cannot be remote on to a PC or on to another 6000 Base Unit.

NOTE

When the equipment is in the Remote screen mode, the icon is displayed at the top of the screen.

Ethernet

Parameters of the local Ethernet network to which the 6000 Base Unit is connected:

Mode - Config 1 to 4	static mode enabling input of the configuration of 4 sites.
- Dynamic	in this mode, which requires a DHCP server, the 6000 Base Unit requests an IP address from this server which will be allocated dynamically if dynamic host configuration is activated on the local network. After selecting this mode or after power-on, the 6000 Base Unit tries to establish a connection to obtain an address from a DHCP server. If for any reason, this process fails, the 6000 Base Unit reverses to static IP address mode with User1 IP address.
Name of site	the user can enter the name of the site in the Edit menu.
IP address	IP address of the 6000 Base Unit
IP mask	address of the mask of the sub-network
IP gateway	IP address of the machine enabling access outside the sub-network.
DNS[1]	IP address of the machine providing the IP address on the basis of the name
Domain name	name of the local network to which the 6000 Base Unit is connected.

Mail

Parameters to configure the mail feature.

Send Mail	Choose Ethernet or None if no media may be used to send mails.
Sender Mode	Auto or Manual. If manual mode is selected, a new line appears right under this one in which to enter the sender address. This allows the recipient to use a valid return address if necessary. When a e-mail is sent with this option, «6000» (followed by the serial number) remains the sender mentioned, but the manual return

1.Domain Name Server

address is automatically used when the mail is answered.

If Sender Mode is set to Auto, any reply to an e-mail sent by the 6000 Base Unit will be lost.

From	This line appears if Sender Mode is set to ***Manual***. Use the button ▶ to enter into an edition window.
Relay Mode	***Auto*** or ***Manual***. If manual mode is selected, a new line appears right under this one in which to enter the mail relay. This option is useful when the network you use needs a relay to send e-mails out.
Mail Relay	This line appears if ***Relay Mode*** is set on Manual. Use the button ▶ to enter into an edition window.

Utilities

Talkset

Parameters to use when the instrument is equipped with the talkset option (see "«Talkset» optical telephone function" page 65).

All 6000 Base Unit are equipped with a loud speaker and integrated microphone as standard.

The 6000 Base Unit offers a conference mode on this line. This mode may be set as:

– Speaker and Micro off
– Speaker only
– Speaker and Micro on

When you are in conference mode, you don’t need the headphone supplied with the talkset option to hear and talk hands free to the user of the remote instrument.

Another line is used in both cases to set the volume level. The same setting is used for headphone and loud speaker.

Use the direction keys or the numeric keypad to change the volume level (Min = 0 / Max = 7).

Automatic shutdown

NOTE

The function for automatically switching off the 6000 Base Unit is available only on battery operation, to save the battery.

This function switches off the 6000 Base Unit automatically if no operation has been performed and no key actuated for a period selected from this menu. Work in progress is automatically saved.

– To activate this function, open the **Utilities** window and move the cursor on to **Auto off**, then choose an option (5, 10 or 30 min.) so that the 6000 Base Unit will be automatically switched off if no key has been actuated for the period selected.
– To deselect this function go into the **Utilities** window, move the cursor on to **Auto off**, then choose option **No**.

Update

When updating the software, (see "Installing a new version of the software" page 90), in the server IP address line of the configuration menu, enter the IP address of the PC on which the updating files were loaded.

Printer

Parameters for configuring a USB printer or for saving JPG files.

Printer — ***None,***, ***USB, Files (Formatted), Files (Screen)***.

If you choose **USB**, you can configure the manufacturer and model type of the printer to be connected on the next two lines.

Files (**Formatted** or **Screen**): allows to print to the JPG format

Files (Formatted)

Choosing in the Printer menu, the option **Files (Formatted)**, you can print the open file of the 6000 Base Unit in the JPG format, exactly as if the file was printed on paper. Therefore, if the file (trace or other) is too large for one A4 page, several JPG files will be created.

Printing a trace to the JPG format

Once the **Files (Formatted)** function is selected:

1 Open the trace to be printed in the JPG format

2 If necessary, make the modifications on the trace (see user manual of the 6000/8000 series).

3 Press simultaneously the direction keys ◀ and ▶
The icon is displayed until the saving process is finished

4 Press the **FILE** key to find the JPG file in the Explorer

NOTE

The JPG file will be saved in the current directory, the last directory used.

The name of the JPG file will be: ***name of the trace file_P01.jpg***

P01 correponds to the page number. Therefore, if the same trace is saved in several pages, the following files will be named: ***name of the trace file_P02*** etc.

Printing another file to the JPG format

Once the **Files (Formatted)** function is selected:

1 Open the file to be printed in the JPG format (for example: Microscope etc.)

2 Press simultaneously the direction keys ◀ and ▶
The icon is displayed until the saving process is finished

3 Press the **FILE** key to find the JPG file in the Explorer

NOTE

The JPG file will be saved in the directory PRINT, on the internal memory of the 6000 Base Unit.

The name of the JPG file will be: ***date (year/month/day)_time (hour/minut/second).jpg***

Files (Screen) Choosing in the Printer menu, the option **Files (Screen)**, you can print the open file of the 6000 Base Unit in the JPG format, exactely as it is displayed on the screen.

Therefore, if you make a zoom on the trace for example, the JPG file will only show the zoom section.

Once the **Files (Screen)** function is selected:

1. Open the trace or file to be printed in the JPG format.
2. Make the necessary modifications
3. Press simultaneously the direction keys ◀ and ▶
   The icon is displayed until the saving process is finished
4. Press the **FILE** key to find the JPG file in the Explorer

NOTE

The JPG file will be saved in the directory PRINT, on the internal memory of the 6000 Base Unit.

The name of the JPG file will be: ***date (year/month/day)_time (hour/minut/second).jpg*** wether it is a trace file or not.

Printer manufacturer	Use the keys ◀ and ▶ to select the manufacturer corresponding to the printer you wish to configure. By default, a model type will automatically be proposed on the next line, corresponding to your manufacturer choice.
Printer type	If the model type set by default for the chosen manufacturer is not correct, you may change it using the keys ◀ and ▶.
ASCII Mode	Select Graphic or Text according to the printer configuration. Some printers do not recognize the ASCII mode, so that you must select Graphic to print files from the Web Browser.

Standalone results

Even if no module is present, the 6000 Base Unit can access and display measurement results.

To access this feature, select **Standalone Results**, and choose the desired application, for example **Consult Fiber Optics**.

Expert Tools

Software Upgrade

The sSoftware Upgrade key allows to make an upgrading of the softwares (see “Installing a new version of the software” on page 90)

Remote Display

The Remote Display menu allows to remote the screen of the 6000 Base Unit to a PC or to another 6000 Base Unit (see "«Talkset» optical telephone function" page 65)

Media utilities

To get access to the menu, click on **Expert tools** then on **Media utilities**.

Formating a USB memory stick

In order to format a USB memory stick, select **Media utilities**, then **Usbflash Format**. Confirm your choice to actually format the USB memory stick.

Only one usb memory key should be plugged in the unit at any one time.

If you wish to use a second USB key (even if it is from the same manufacturer), then you must fully reboot the unit. (i.e. power down and remove external power if it was present).

As for any media formatting, please note that all data present on the USB memory stick will be irremediably lost

Desktop Applications

Several desktop applications are available with the 6000 Base Unit.

To have more information about this function, see Chapter 8 “Desktop applications” page 81.

LTS (Loss Test Set)

5

A variety of LTS options are available when ordering. Option 80/PM consists of a power meter only. The other options in the 80XXTS/PM series combine optical telephone, power meter and one or more sources of various wavelengths. See references in "References of options for the 6000 Base Unit mainframe" page 106, for wavelengths of the sources in each option.

The topics discussed in this chapter are as follows:

– “The principle of optical power and attenuation measurements” on page 52
– “Connection to the power meter and the source” on page 53
– “Configuring the LTS” on page 54
– “Display of results and commands” on page 57
– “Making a measurement” on page 58
– “Storing and reloading LTS results” on page 60

The principle of optical power and attenuation measurements

Power measurements

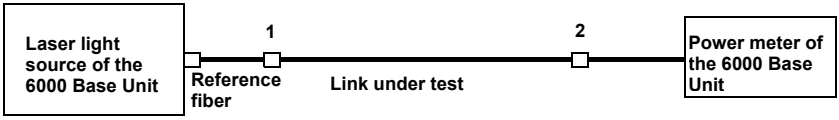
A power meter, is all that is needed to measure emitted or received power:

- to measure emitted power, connect the power meter directly to the output of the optical emitter;
- to measure the power at the input of an optical receiver, the power meter is connected to the end of the fiber, at the point where the optical receiver would be connected.

Attenuation measurements (optical link loss)

For measurement of the attenuation of power in a complete link or in elements such as sections of fiber, connections or optical components, a light source and a power meter are required.

This attenuation is usually deduced from the measurement of optical power at two points:



Attenuation $A_{(dB)} = P1_{(dBm)} - P2_{(dBm)}$

To perform accurate measurements, the following conditions are vital

- Use one of the light sources of the LTS or a light source which is stable both in time and as a function of temperature.
- Make sure that all connections and fibers and the receiving cell are perfectly clean.
- Use a reference link between the laser source and the test subject. If several measurements are to be made under identical light injection conditions, this reference fiber must not be disconnected during the period while measurements are taking place.

Insertion loss method

1 The power meter is first connected to the laser source via the reference fiber: P1 is measured.

2 Then the fiber to be tested is inserted between the reference fiber and the power meter: P2 is measured.

The difference between P2 and P1 gives the attenuation of the fiber under test.

It is preferable to use the same type of connector at both ends of the fiber being tested, to ensure the same connection conditions for measuring P1 and P2.

Accuracy of measurements

– A high degree of accuracy is often required. It is then necessary to perform a preliminary calibration without the fiber under test to eliminate the losses due to connections as far as this is possible. To do this, use the «Reference Value» function.

– For measurements in the laboratory, where both ends of the fiber are on the same site, the repeatability of attenuation measurements is better than 0.1 dB. For measurements in the field, where the two ends are on different sites, variations from one measurement to another are of the order of ± 0.2 dB (using a relative measurement).

Connection to the power meter and the source

Figure 15 Optical connectors

The type of optical connector used for the power meter is UPP (Universal Push Pull), which is compatible with all diameter 2.5 mm connectors (FC, SC, ST, DIN, E2000, etc.)

If the source option is present, the source connection is the same as that for the talkset.

Configuring the LTS

The LTS function is an option chosen at the time of order and incorporated into the 6000 Base Unit in the factory.

To activate the function:

– Press the **SYSTEM** button
– Use the direction keys to select the LTS icon (framed in green) and press the confirmation key : the icon in the frame will turn orange.

The effect of this action will to be to bring the power meter into use, but not to activate the source.

Configuring the measurement parameters of the power meter

The measurement parameters can be accessed with the **SETUP** key.

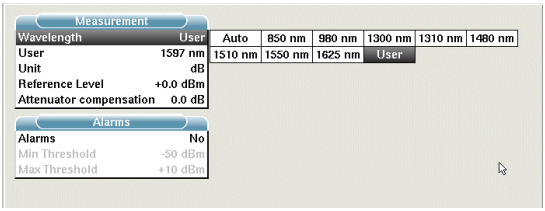


Figure 16 Configuration of power measurement

Lambda	Selecting wavelength: - Auto: the wavelength of the input signal will be automatically detected and selected to perform the measurement: 850, 980, 1300, 1310, 1420, 1450, 1480, 1490, 1510, 1550 or 1625 nm - User: choice of wavelength on the next line in the menu.
User choice	(if the User option was selected in the Lambda line) selection of the wavelength between 800 nm and 1650 nm, in 1 nm steps, by means of the direction keys ◀ and ▶.
Unit	Unit of power displayed: - Watt, dBm for displaying absolute power

- dB for displaying a result relative to a reference (link loss)

Reference level

If dB units were chosen in the previous line, selection of the reference value for the wavelength selected. Using the direction keys, first choose the wavelength, then press the > key to access choice of the value (+XXX.XX), then confirm this value with the validation key .

This reference is also automatically available, in the **Results** page, using the **Set as Reference** key.

Attenuator compensation

Choice of level to be applied to the wavelength chosen for measurement to compensate for the loss due to the external attenuator (+XX.XX dB). First use the direction keys to choose the wavelength, then press > to access choice of value, then confirm this value by pressing the validation key .

NOTE

To copy a Reference Level or a Attenuator Compensator on all wavelengths, select the reference wavelength and click on **Update for All Wavel.**.

Configuring the alarm parameters of the power meter

Alarm

Activation of the Alarm function : any result below the lower threshold or above the upper threshold will be displayed in red on the Results page.

Lower and upper thresholds :

Choice of lower and upper thresholds for each available wavelength, from -60 to +40 dBm (selected with the direction keys).

NOTE

To copy one value of the Lower or/and Upper threshold for all wavelengths, select the reference value and click on **Update for All Wavel.**.

NOTE

A continuous push on the direction keys, increment the value of 10 dBm.

Configuring and displaying the parameters of the source

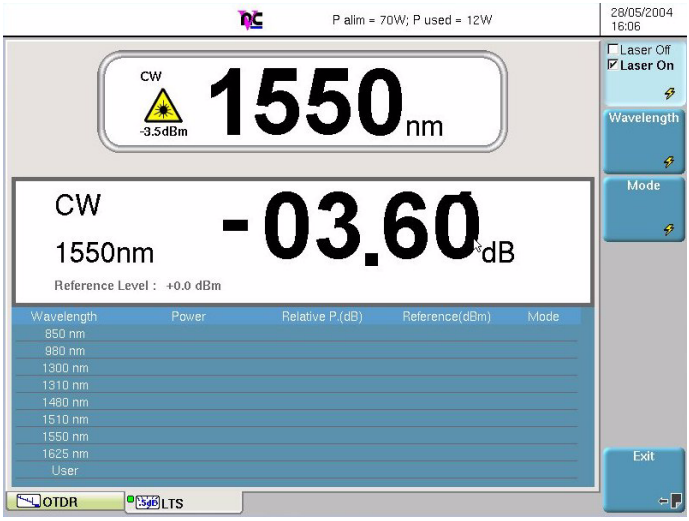


Figure 17 Configuration of the source

Laser — Activation or shut-down of the laser (same function that the **START/STOP** button)

When the laser is **on**, the icon is displayed.

The parameters of the source can be accessed directly on the result screen of the LTS module, by touching the **Source Configuration** soft key.

Wavelength — To change the wavelength when a multi-wavelength source is present (depending on option).

The wavelength value is displayed.

Mode — To vary the mode of emission of the source. Possible modulation values are:

- 270 Hz
- 330 Hz
- 1 kHz
- 2 kHz
- Auto (the sources emit on determined frequencies to enable the power meter to detect the wavelength used automatically)

– TwinTest (cyclical emission on all available wavelengths for a few seconds on each wavelength), compatible with the JDSU OLP 5/6/15/16/18.
– CW (continuous emission)

The mode used is displayed, above the icon .

Display of results and commands

The results page called up by the **RESULTS** button**,** gives the information relating to the measurement in progress, results previously saved and the commands available for measurement and saving.

Result of the measurement in progress

The power measured by the power meter is displayed in large characters, in the units selected in the **SETUP** menu, together with:

– the mode of transmission of the signal measured: continuous (CW) or modulated to a frequency of 270Hz, 330Hz, 1KHz, or 2KHz.
– the wavelength of the signal measured.
– the reference level expressed in dB.
– the level of Attenuation Compensation.

Table of results

For one and the same fiber, the power meter displays a table of 9 results corresponding to the different possible wavelengths. The table shows the power measured in dBm, the relative power (in dB) and the reference level in dBm (if units = dB), together with the mode.

A measurement result is displayed in the table when the **Keep Result** softkey is pressed.

The **Clear Table** softkey orders deletion of all the results displayed in the table.

If the Alarm function has been activated, any result that exceeds the selected thresholds appears in red in the table. Otherwise, results are shown in the table in green.

When the instrument is switched off, results present in the table are not saved.

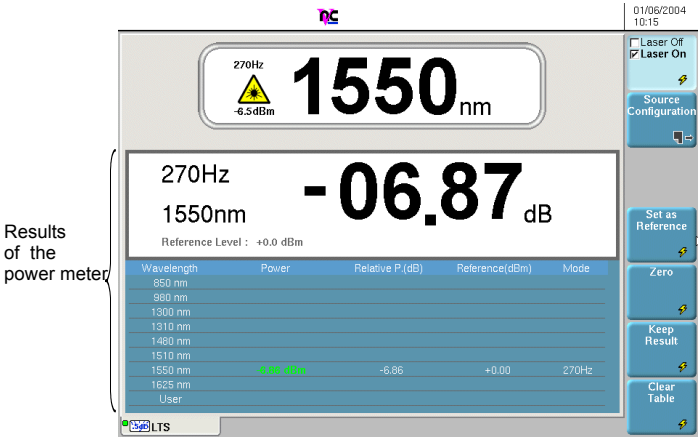


Figure 18 Results and commands of the LTS

Commands of the power meter parameters

When the LTS function is selected, the following softkeys are available on the results page:

<Set as Reference>	Selects the current result as reference value to measure the attenuation of a link. This reference is displayed under the measurement result until a new reference value is chosen.
<Zero>	Adjustment of the Zero value when the power meter's optical input is closed with a plug (a validation is required).
<Keep Result>	Saves the result on the corresponding line of the table.
<Clear Table>	Deletes all the results recorded in the table.

Making a measurement

The power meter is started up as soon as the LTS function

is activated in the **SETUP** menu.

Power measurement is automatically updated in consequence. The value «<-60 dB» is displayed when the laser is switched off and if the source output is looped on to the power meter input.

If a 6000 Base Unit source is used, the **START/STOP** key or the **Laser on/Laser off** soft key must be used to start or stop emission of light.

Power measurement

– Connect the light source to be tested to the rear connector (see "Connection to the power meter and the source" page 53).
– In the **SETUP** menu, choose the units dBm, dB or Watts.
– Press the **START/STOP** key to start the laser**.**

  The result will appear in the results page and can be memorized in the table (see "Table of results" page 57).
– Press the **START/STOP** key to stop the laser**.**

Optical link loss

Setting the zero value of the power meter

It is important to set the zero of the power meter before making any measurements where accuracy is required, as the noise from the germanium photodiode fluctuates over time and with variations in temperature.

1 Fix the plug over the optical input of the power meter so that no light can reach the photodiode of the power meter. If the zero adjustment is made without this plug, an error message may be displayed, as the photodiode will detect too much light.

2 In the **Results** page, press the **Zero** soft key and validate.

Carrying out the reference measurement

1 Fix the adapter corresponding to the jumper to the optical connector of the power meter.

2 Connect the jumper between the input of the power meter and the output of the source.

3 Configure the same wavelength on the source and the power meter.

The power measured is displayed in the results page of the LTS.

4 Press the **Set as Reference** soft key to save the result displayed as reference value.

Measurements on the fiber under test

After defining the reference value, proceed as follows to make the measurement:

1 Fix the jumpers and connectors needed to connect the fiber to be tested between the source output and the power meter input.

2 In the set-up menu, select dB units.

3 The power displayed in the Power Meter window corresponds to the optical loss of the link tested. It can be displayed in the table (see "Table of results" page 57).

It is not possible to use the source at the same time than the **Talkset** option or the **Data Transfer**.

Storing and reloading LTS results

File Setup

Click on the button **FILE** to access the **File** setup. See the chapter «File management» in the user manual «8100 modules series» for a complete description of all parameters, options and the explorer.

Storing results

In order to save the results of a LTS measurement, click on **FILE** and select **Store trace**. Two files are being saved :

– The first file is to be used with the 6000 Base Unit and allows to retrieve all LTS measurements results. It is saved with the extension «.Lts».

– The second file is a ASCII file using tabulations to separate values. It is saved with the extension «.txt» and cannot be opened by the 6000 Base Unit. It has been designed to be used with a spreadsheet program on a PC where it allows to retrieve all LTS measurement results and format them in a nice customized table.

Loading results

In order to load the results of a LTS measurement, select a file with the extension «.Lts» in the file explorer (see the chapter «File management» in the user manual for «8100 modules series»), click on **Load** then **View trace**.

The LTS tab is displayed with the loaded results in the table.

VFL, Talkset and Data transfer

6

The VFL and Talkset functions of the 6000 Base Unit described in this chapter are basic options installed in the factory.

The topics discussed in this chapter are as follows:

– “VFL and Talkset connectors” on page 64
– “Visible source function (VFL)” on page 64
– “«Talkset» optical telephone function” on page 65
– “«Data», the data transfer function (future function)” on page 66
– “VNC - remote screen” on page 68

VFL and Talkset connectors

Talkset connectors

These connectors, together with the connector of the Power Meter option, are located at the rear under a protective flap.

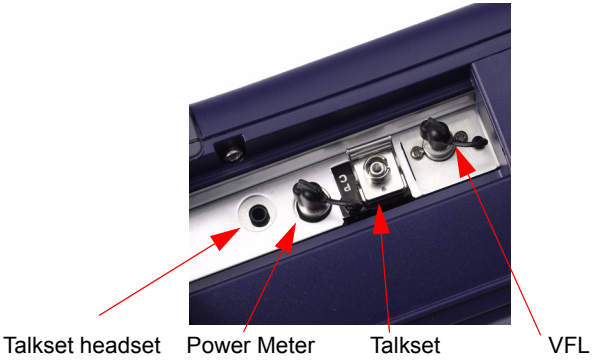


Fig. 19 Connectors

To change the adapter situated on the optical connector of the talkset, pull the lever shown above.

To put the adapter back, engage it in the optical connector and push in, pressing on the connector and not on the lever, so that the lateral lugs of the connector engage in the notches of the adapter. Then press the connector lever to lock it.

VFL connector

The type of optical connector used for the VFL source is UPP (Universal Push Pull), which is compatible with all diameter 2.5 mm connectors (FC, SC, ST, DIN, E2000, etc.)

Visible source function (VFL)

This function is used to emit a red light signal of frequency 1 Hz into a fiber to detect any defects in the dead zone of the reflectometer, or to identify it.

This function is suitable for short fibers (length < 5 km) or the first few metres of a long fiber.

NOTE

Identification is facilitated by the blinking of light in the fibre.

To emit a light signal into a fiber:

– Connect the fiber to the VFL port on the rear panel (see above)
– Press the **SYSTEM** key**,** then press <- and -> to select the VFL icon and confirm by pressing the validation key .

Selection of this option is compatible with another function (OTDR, etc.).

«Talkset» optical telephone function

This enables two operators at opposite ends of an optical link to communicate along the fiber. One end of the optical link must be provided with an 6000 Base Unit equipped with the Talkset option. The other end can be provided with another 6000 Base Unit or an OFI 2000 or a 8000 Base Unit, all equipped with the Talkset option, or an OTS-55.

NOTE

It is possible to use the optical telephone of the 6000 Base Unit and to carry out measurements at the same time.

Talkset configuration

The talkset configuration is set in the setup screen (see "Talkset" page 45)

Connections

At each end of the fiber (see "VFL and Talkset connectors" page 64):

– Connect the fiber to the Talkset port of the 6000 Base Unit, either directly or through jumpers.
– A headset (with earphones and a microphone) supplied with the option may also be plugged into the talkset module jack.

Establishing communication

On the caller 6000 Base Unit, press the **SYSTEM** button, then select and confirm the Talkset option:

– If the remote instrument is ready to receive (on standby), the Talkset icon turns orange, beeps are emitted, and the icon appears at the top of the screen: telephone communication can now take place.
– If the remote instrument is not ready to receive, the Talkset icon does not change color and a message is emitted.

NOTE

The talkset icon is displayed on the top banner as long as communication remains established, letting the user know that the connection is working

When communication is established, the headset is automatically enabled if plugged in. However, the loud speaker and internal microphone must be correctly configured in the setup menu to work accordingly (see "Talkset" page 45)

Adjusting volume level

The sound is transmitted to the earphones of the headset and, if this function has been activated, to the speaker in the 6000 Base Unit base. To activate the base loudspeaker and adjust the volume:

– press the **SETUP** key.
– under the Utilities heading of the menu, select the Talkset line: it is then possible to activate the base loudspeaker and adjust the volume.

When communication is over, deactivate the Talkset function on the 6000 Base Unit. This deactivation can be done by either 6000 Base Unit.

«Data», the data transfer function (future function)

This enables two 6000 Base Unit at opposite ends of an optical link to transfer data along the fiber.

NOTE

Each end of the optical link must be provided with an 6000 Base Unit equipped with the Talkset option.

NOTE

It is possible to use the Data transfer feature while using the optical telephone of the 6000 Base Unit. Nevertheless, the data transfer speed will be slightly decreased.

Data transfer configuration

No specific data transfer configuration is necessary

Connections

At each end of the fiber (see "VFL and Talkset connectors" page 64):

– Connect the fiber to the Talkset port of the 6000 Base Unit, either directly or through jumpers.

  Data transfer uses the same fiber as the optical telephone.

Establishing communication

On the caller 6000 Base Unit, press the **SYSTEM** button, then select and confirm the Talkset option:

– If the remote instrument is ready to receive (on standby), the Data icon turns orange, beeps are emitted, and the icon appears at the top of the screen: data transfer can now take place.
– If the remote instrument is not ready to receive, the Data icon does not change color and a message is emitted.

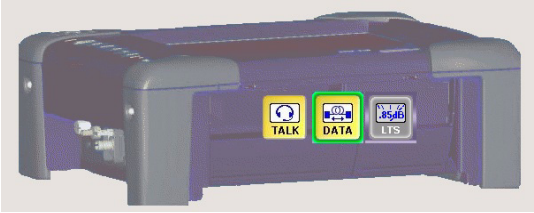


Fig. 20 Active communications appear in yellow

NOTE

Data transfer varies according to the type of application you use. For Fiber Optics for example, you can use the explorer. The distant 6000 Base Unit will be shown just like a disk and all file and directory features can be used from and to that disk.

To end the communication, deactivate the Data function on one of the 6000 Base Unit (the local or the remote one).

NOTE

The data icon is displayed on the top banner as long as communication remains established, letting the user know that the connection is working

NOTE

Whoever begins the communication, data transfer may be done bidirectionally in the exact same manner.

VNC - remote screen

This enables an operator at one end of an optical link to take control over another 6000 Base Unit connected at the other end, using the fiber.

NOTE

Each end of the optical link must be provided with an 6000 Base Unit equipped with the Talkset option.

VNC configuration

Before it can be remote-controlled, the 6000 Base Unit must be configured as explained in "Remote screen" page 43.

Connections

At each end of the fiber (see "VFL and Talkset connectors" page 64): connect the fiber to the Talkset port of the 6000 Base Unit, either directly or through jumpers.

Remote screen via VNC is done via the data transfer feature, and on the same fiber as the optical telephone.

Establishing communication

On the caller 6000 Base Unit, press the **SYSTEM** button, then select and confirm the **Data** option:

– If the remote instrument is ready to receive (on standby), the Data icon turns orange, beeps are emitted, and the icon appears at the top of the screen: data transfer can now take place.
– If the remote instrument is not ready to receive, the Data icon does not change color and a message is emitted.
– Click next on **Expert tools**, **Remote Display**, and on **Switch to remote screen**.

Your screen is now fully replaced by the distant screen, and everything you do on your 6000 Base Unit is in fact done on the distant 6000 Base Unit.

An icon appears in the top banner of both 6000 Base Unit.

A slight normal color degradation may be seen on the 6000 Base Unit controlling a distant instrument.

End of a VNC session

In order to end a VNC session, you can :

– Return to the menu **Expert tools > Remote Display** and click on **Return to local screen**. (Recommended solution)
– Deactivate the data function on either 6000 Base Unit connected.
– Set **remote screen** to **off** (see “Remote screen” on page 43)
– Disconnect the fiber

NOTE

The VNC icon in the top banner of the screen lets you know at all times whether you are in a VNC session or not.

Scope

7

The scope function is a hot-plug feature enabled directly when inserting a USB scope supplied as an accessory (see"References of scopes and associated accessories" on page 108).

The topics discussed in this chapter are as follows:

– "Scope feature" on page 72
– "Scope connection" on page 72
– "Result display" on page 73
– "File toolbar" on page 76
– "Mosaic Mode" on page 77

Scope feature

This feature enables you to verify that your optical connectors are in perfect shape and very clean condition.

Fig. 21 6000 Base Unit linked to a scope via USB, in order to check a connector

Scope connection

To use the scope function, use a USB scope supplied by JDSU (see the list of all 6000 Base Unit accessories in "References of scopes and associated accessories" on page 108).

– Plug in your scope into a USB port from the 6000 Base Unit.
– Plug the fiber connector into the microscope fiber slot.
– Push the button **SYSTEM,** then use the arrows keys <- et -> to select the icon **Scope** and validate the selection by pushing the validation key .

You may select this option while other options are already selected (e.g. OTDR)

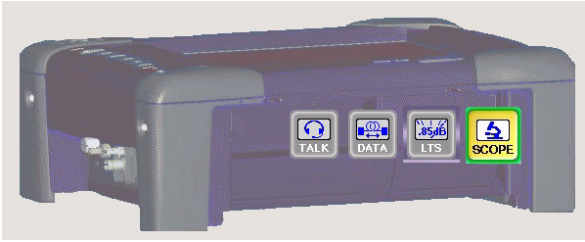


Fig. 22 Selection of the Scope icon to use the scope

In order to see the **Scope** icon and select it, you must first make sure that the scope is correctly plugged into an available USB slot, before you reach this screen. If this was not done, quit this screen and come back to it after plugging in your scope correctly. This will refresh your detected devices.

Result display

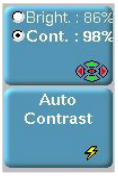
To display the result, click on **RESULTS** while **Scope** is still actively selected.

Camera mode

Set the key **Camera/Freeze** on **Camera**, to get a live picture of the scope result.

Use the scope wheel to tune the sharpness of the picture.

Luminosity and contrast settings



Luminosity and contrast may be set manually by using the key **Bright/Cont.**. Once you select which parameter you wish to modify, use the arrow keys ▲ and ▼ to tune the luminosity or contrast to the desired value. Note that the set values are displayed on the key.

You may also choose to use the function **Auto Contrast** in order to get settings calculated automatically by the instrument.

NOTE

Saturated parts of the picture appear in yellow. Modify the luminosity and contrast settings or use **Auto contrast** to modify the actual setting and remove saturation.

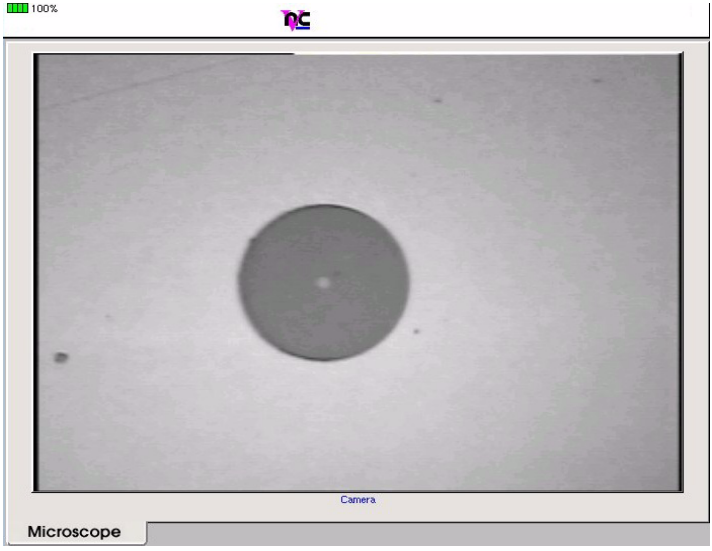


Fig. 23 Example of the result you get using the scope option on a connector in perfect condition

Freeze mode

Once the result is acceptable (sharpness, luminosity and contrast are tuned correctly), you may **freeze** the picture. This feature allows to store in memory the resulting picture in order later to compare it to others or save it in a file.

Freezing a scope result does not store the picture in a file (see "Saving a picture" on page 76). The result will be lost if the instrument is shut off, or if more than 3 pictures are frozen (see "Mosaic Mode" on page 77).

NOTE

The button set on the lead allows to freeze the picture or to take a snapshot.

Adding a comment

A key **Comment** allows you to enter a comment to your picture if necessary. This comment appears at the bottom left of the picture.

The right bottom of the frozen picture also contains the date of the acquisition (where the picture was frozen).

NOTE

Both the comment and the date will be saved with the picture if that picture is saved later on.

NOTE

The comment may be modified at any time later on.

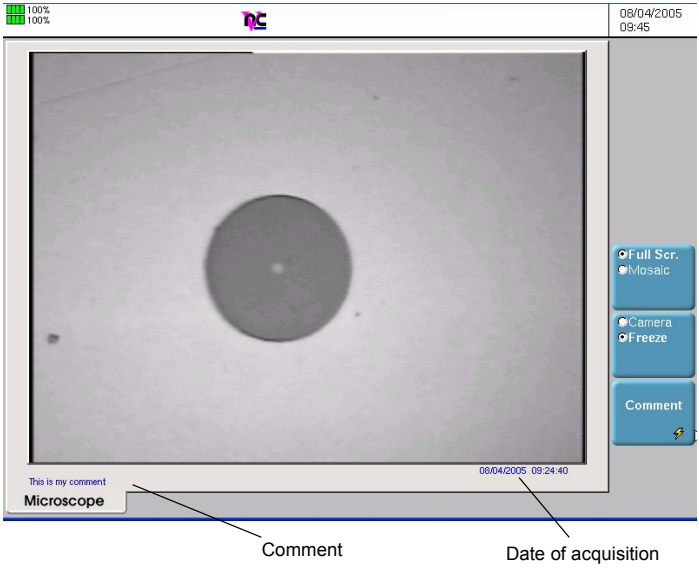


Fig. 24 Frozen Scope image

File toolbar

Click on the **FILE** button to access the File toolbar on the right of the screen.

Saving a picture

It is possible to save the frozen picture resulting from the scope.

To do this, select **Save**. An edition screen is displayed in which to enter alphanumerical characters in order to save the file with an appropriate name.

NOTE

By default, files are saved and read in the directory ***disk/Scope*** (internal memory of the 6000 Base Unit). It is possible to move these files to another place, via the file explorer.

However, reading will always be done in the initial directory.

NOTE

Files are saved using the JPG format.

Loading a picture

It is possible to retrieve and load a picture stored in the default directory (see "Frozen Scope image" on page 75 to know the default directory).

Select **Load**. The list of all files in a JPEG format are presented in a list, showing for each file :

- An icon indicating the type of JPG file (unknown picture or Recognized scope picture)
- The name of the file
- The date of acquisition of the picture (only appears for recognized scope pictures)
- A potential comment (only appears for recognized scope pictures if comment is present)

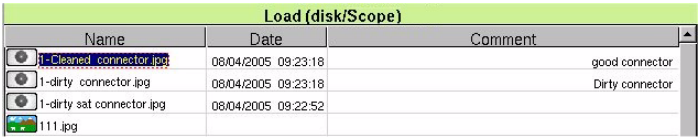


Fig. 25 List of all JPG files to choose from before loading a file

NOTE

Recognized pictures are images resulting from the Scope option and saved on internal memory via the 6000 Base Unit.

Some pictures resulting from the Scope option may appear nevertheless unrecognized, if they have been stored with a different 6000 Base Unit software version, or if the JPG file has been opened and modified under another JPG editor. Opening such a picture and saving it again with the current 6000 Base Unit software version will allow this file to be displayed later with the scope logo.

Even though the JPG editor of the Scope function has been designed to display Scope pictures in black & white, it is also possible to open any JPG valid file and display in color the corresponding picture. That picture is enlarged or shrunk to the size of the display (full screen or mosaic, see."Mosaic Mode" on page 77).

NOTE

The JPG editor may open all files in a JPG valid format, wether the extension is «.jpg» or «.jpeg».

Click on the **RESULTS** button if you wish to come back to the previous screen

Mosaic Mode

It is possible to display only one picture in full screen (640 * 480 pixels) or up to four pictures (320*240 pixels each, including the live camera picture) in mosaic mode. Use the key **Full scr./Mosaic** to switch from one mode to another.

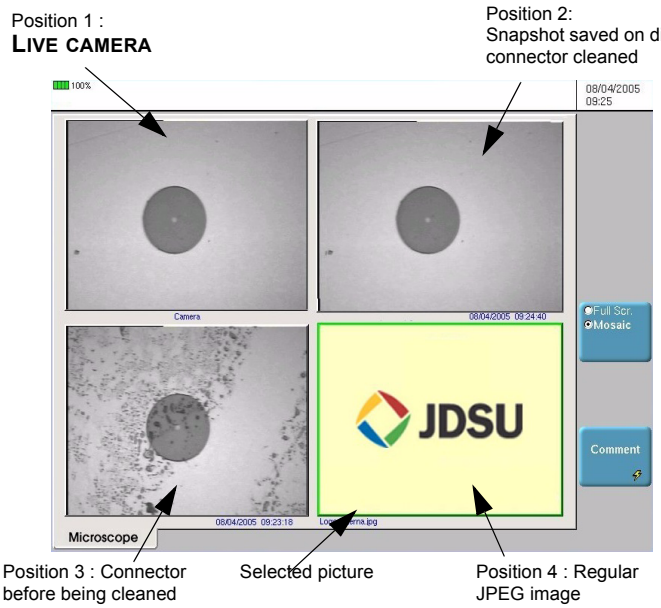


Fig. 26 Mosaic mode

You may select any of the pictures by using the arrow keys ◀ and ▶.

The selected picture is framed in green.

The toolbar on the right varies according to which picture is selected (camera, or static picture).

Camera

All the Contrast and Luminosity settings are available just like in full screen.

Snapshot — The live picture from the camera is frozen but does not replace the live picture at position 1. The new snapshot is placed at the second position, and all existing pictures are pushed to the next position.

If all positions were taken, the picture that was once at the fourth position is unloaded from memory. Frozen pictures and snapshots are lost, unless they were saved on the internal memory.

Static pictures

Comment — It is possible to add a comment to a picture, just like in full screen.

File toolbar

The File toolbar is also available in mosaic mode. Actions made by this toolbar will concern the selected file.

Click on the **FILE** button to access the File toolbar on the right of the screen.

Up to two choices are presented :

Load — Refer to "Loading a picture" on page 76

Save — This choice is only available if the picture has been recognised by the system as a Scope picture, either before opening it or after opening it (pictures created with different versions). When this choice is available, refer to "Saving a picture" on page 76.

A new loaded picture will take the place of the selected picture, unless:

– the selected picture corresponds to the camera (first position). In this case, the rule is the same as when a snapshot is made (see "Camera" on page 78).
– free spots are available in the mosaic. In this case, the new picture takes the second position while other ones are pushed to the next position.

NOTE

Clicking on **Save** while the camera is selected will both create a snapshot (see "Camera" on page 78) and save it on the internal memory.

Desktop applications

8

Several desktop applications are provided to you, thanks to the integration of free software released under the free licences (GPL, LGPL, BSB or other). Their purpose is to bring more functionality to the 6000 Base Unit. JDSU **doesn't provide any warranty or support regarding these free software.**

To access desktop applications, press the button **SYSTEM**, and the soft key **Desktop applications**.

The topics discussed in this chapter are as follows:

– "PDF viewer" on page 82
– "Web browser (future function)" on page 83 (future function)

NOTE

The PDF is a standard application on the 6000 Base Unit.

PDF viewer

General information is provided in this chapter. Please refer to the button inside the PDF viewer to find the web site where complete documentation may be found.

Opening a PDF document

The simplest way to open a pdf file is to press **FILE**. Select **Explorer,** look for your file and then select **Load >Confirm Load** to load the corresponding file. The file opens automatically in the PDF viewer.

Interacting with a PDF document

Once your document is open, you may browse through different pages very quickly, zoom to a particular level, find a special name or sentence, rotate the page... All these features are available via buttons on the screen.

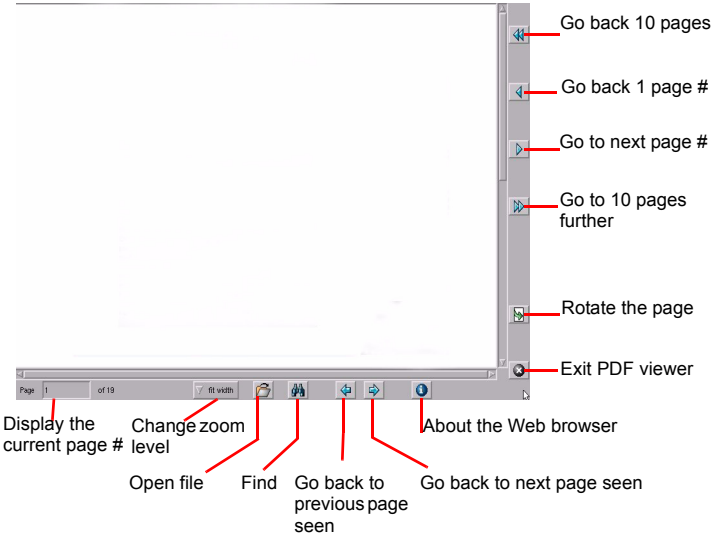

Go back 10 pages
Go back 1 page #
Go to next page #
Go to 10 pages further
Rotate the page
Exit PDF viewer
Page 1 of 19 fit width
Display the current page #
Change zoom level
Open file
Find
Go back to previous page seen
Go back to next page seen
About the Web browser

Fig. 27 PDF Viewer Graphical User Interface

The buttons on the right are pressed using the functions keys of the 6000 Base Unit, the touchscreen or via the mouse. The buttons on the bottom of the PDF viewer, may only be used with a mouse or a touchscreen.

A PDF document is always loaded to fit to the screen in width. You may later adapt the zoom level if necessary.

NOTE

You may scroll in all directions using the direction key pad of the 6000 Base Unit or of an external keyboard, or by dragging the scroll bars with the mouse.

Web browser (future function)

Please refer to the Help page in the Help menu from this application (see figure "Web browser application menu" on page 83), to find a complete documentation.

Starting the web browser

To access this application, click on the soft key **Web browser**

The web browser is launched. You can see the icon

at the top of the screen.

The application menu is hidden until you request it. To access the Web browser application menu, click on the top of the screen. The menu is displayed and you may perform any necessary actions.

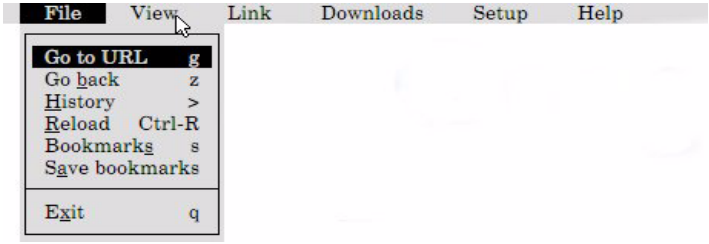


Fig. 28 Web browser application menu

Setting the internet connection

The connection mode to internet is the same as the one defined for e-mail. Make sure you set this setting correctly to be able to access the internet (see "Mail" on page 44).

Make sure to configure your proxy if needed (go to the Web browser Setup menu: network options).

You need to select **Setup / Save options** in order to save your changes for the next time you launch the web browser.

6000 Base Unit Keys

Some of the 6000 Base Unit buttons have been assigned to specific actions within the web browser:

SYSTEM:	Leaves the application (but does not disconnect)
SETUP:	Displays the menu - Also allows to escape in some cases
:	Switches the focus to the next or previous link on the page
:	Goes back to the previous page
:	Follows the selected link (acts like if the link was selected)
:	Acts like the «Enter» key of a keyboard
FILE (long):	Goes to a URL. The address is blank by default: you need to enter the full address.
FILE (short):	Goes to a URL based on the current URL. The address is by default the current one, and you may just update it with few changes.
RESULTS:	Reloads the page
START/STOP:	Edits the bookmark manager.
F7:	Switches to the virtual keyboard application (see "Virtual keyboard" on page 85). **F7** corresponds on the 6000 Base Unit, to the very last button on the right panel (button number 7). Note that **F7** may also be typed on a regular keyboard (with functions keys).

NOTE

You will also find this information in the help menu of the browser, as a reminder.

NOTE

The **SCRIPT** button has no action within the web application.

Virtual keyboard

To call the virtual keyboard, use the **F7** key (see "6000 Base Unit Keys" on page 84).

– If you click once, the virtual keyboard will appear at the bottom of the screen.
– If you click twice, the virtual keyboard will be moved to the middle of the screen.
– If you click again, you exit the virtual keyboard.

You may now use your virtual keyboard using your mouse or your touch-screen to type each key.

NOTE

In case you have neither a mouse nor a touchscreen, you may still move and select keys using the direction keypad of your 6000 Base Unit.

Virtual Keyboard application menu

You may change the keyboard according to your country and/or access many other functions, by clicking on the key

.

This key lets you access the full application menu. You may also access more information about the virtual keyboard.

To leave the virtual keyboard, click on F7 until it disappears.

Opening a PDF document

PDF documents may be opened and read within the Web browser.

Please refer to "PDF viewer" on page 82 for more information about that application.

When you try to follow a link to a PDF file, you are requested to choose whether you wish to save the file or to directly open it.

If you want to open the PDF viewer within the Web browser, you must further click on the icon to go back to the web browser.

NOTE

The web browser will open a PDF document, not a URL including a PDF file.

Leaving the web browser

Depending on how long you want to leave the web browser and on your connection mode, you may:

– Leave the web browser running and switch to another task. To do this: click on the **SYSTEM** button. You can see that the Web icon remains, to indicate that the web application is still running in the background. Nevertheless, you have now a complete access to all the 6000 Base Unit functionality. To go back, you must select again the **web browser** in the **Desktop Applications** menu. The application will reopen much faster, and all your environment will be the same (last current page, possibilities to go back...)

– Quit the application using the **Web browser** application menu: choose **FILE**, then press **Exit** and confirm. You should use this method to stop the connection.

Maintenance

9

This chapter gives the main maintenance procedure for the 6000 Base Unit.

The topics discussed in this chapter are as follows:

– “Maintenance procedure” on page 88
– “Cleaning” on page 89
– “Precautions relating to optical connections” on page 89
– “Installing a new version of the software” on page 90
– “Replacement of the small PCB battery (for backup)” on page 95
– “General information on warranty” on page 96

For software updates, or to find our JDSU representatives and technical support offices around the world, please visit our web site: www.jdsu.com.

Maintenance procedure

Maintenance work on this instrument must only be undertaken by qualified personnel using suitable equipment.

In most cases, it is advisable to contact the nearest JDSU Service Centre, which will undertake the appropriate troubleshooting and repair work.

The performance and technical complexity of the 6000 Base Unit class this instrument in a new generation of equipment, for which JDSU has laid down a maintenance policy based on the principle of standard module replacement.

In implementation of this policy, we have set up powerful card trouble-shooting test resources in our factories and a rapid dispatch system operating between our factories and branches.

Only by this procedure can the high quality of the instrument continue to be ensured after repair work. This procedure also has the advantage of reducing repair costs and time.

In the interests of quality and efficiency, we strongly recommend adoption of the following procedure in the event of a fault, before any other steps are taken:

– Verify that the instrument is plugged in.
– Check the connections of any peripheral equipment to the 6000 Base Unit.
– If a fault is detected, or in case of doubt, it is advisable to contact the nearest JDSU Service Centre, which will undertake the appropriate repair work.

Returning an instrument

When returning an instrument, it is essential to indicate the following minimum information:

– the type and serial number of the instrument (on the identification label) and the configuration code (under the bar code)
– a description of the fault found on the instrument.

The returned instrument will then be repaired and calibrated.

Guarantee conditions

Any repair operation supervening within the guarantee period of the instrument will be carried out at the expense of JDSU. However, for any sub-assembly upon which work has been carried out otherwise than by JDSU Service Centers, the cost of a replacement sub-assembly will be invoiced.

Cleaning

Cleaning plates and housings

The front and rear plates and the housings may become tarnished with handling. To clean them, use only a rag moistened with soapy water.

Never use any product containing acetone, trichloro-ethylene, benzine or alcohol, as these will attack the printed markings.

Cleaning the screen

To clean the screen, use an antistatic product.

Precautions relating to optical connections

- The normal operating life of an optical connector is usually of the order of a few hundred manipulations. It is therefore advisable to manipulate the optical connections of the 6000 Base Unit as rarely as possible.
- The proper operation of the instrument and its accuracy of measurement are dependent on the cleanliness of the environment and the optical connectors as well as the care taken in its manipulation.
- The optical connectors must therefore be clean and dust-free. If the optical connection is not being used, protect the connections of 6000 Base Unit using the protective plugs provided.

As an example, the results of measurements made with connectors that have not been cleaned will display an error of the order of 10% for all measurements. This error is additional to other errors inherent in the measurement process and due, for example, to the quality of the fiber

(circularity and concentricity), the means of connection (axis alignment, distance between fiber faces, quality of fiber faces) and propagation modes.

Cleaning the optical cable connector

- Use a non-linting type of paper, such as Joseph paper, soaked in isopropylic alcohol.
- Pay particular attention to the polished face of the fiber, rubbing it in a direction perpendicular to the axis of the fiber.

Cleaning the optical connections of the 6000 Base Unit

- Squirt a highly volatile solvent (such as isopropylic alcohol) into the connector.
- Blow out the connector using a clean dry air supply from an aerosol can fitted with an extension.

NOTE

If your module has a universal connector, unscrew its adaptor to access the ferule.

Installing a new version of the software

When a new software version is loaded, there is a risk of re-initialization of the internal memory. Before installing the new software, it is therefore advisable to to save the results in the memory, using the **Save** function in the **Memory** menu called up by the **FILE** button.

Do not interrupt the installation process, as this could damage the instrument.

To avoid any interruption of the installation procedure, the 6000 Base Unit must be operating on the mains: if the procedure is started while operating on battery, a message indicates that the instrument must be connected to the mains.

Where and how to obtain the new software

The new version of the software can either be procured on a storage medium (CD-ROM, USB stick memory) from your JDSU Customer Service, or can be downloaded from JDSU's internet site: www.jdsu.com.

Downloading from Internet

When the software is obtained from the Internet, it must be saved on a storage medium before the software upgrade of the product can be carried out. To do this, on the JDSU web site, open the file entitled ***README.txt*** in the folder where the download is located and follow the instructions it contains.

Installation from a PC via Ethernet

The new versions can be installed according 2 methods:

– from the harddisk of a PC
– from the CD-ROM drive of a PC

Installation from the harddisk of a PC

1 Connect the 6000 Base Unit into mains with the AC plug, and switch it on.

2 Connect the 6000 Base Unit to the PC by an Ethernet link

NOTE

Use a cross over if the 6000 Base Unit is directly connected to the PC or a direct cable if the 6000 Base Unit is connected to the LAN.

3 On the PC, unzip the upgrade file in a directory, such as `C:/6000_Base_Upgrade/`

4 Open a DOS console, by selecting **Windows > Start** (bottom right of the PC screen) **> All programs > Accessories > Command prompt.**

5 Then type the command `subst N: C:/6000_Base_Upgrade/`

6 Close the DOS console.

This command will create a virtual drive N: (N: is an example)[1]

7 Run ***TFTPD32.exe***: note the «Server Interfaces» address which appears in the TFTPD32 window.

8 Run ***FTP server.exe***. An error message will appear: click on **OK**.

The window «Pablo's FTP server» is displayed. Click on the green arrow (or select menu **File > Start)**.

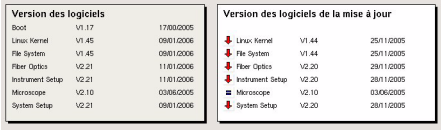
9 On the 6000 Base Unit, press the **SYSTEM** key, then System Menu: in **Utility > Upgrade Parameters > Server adress**, enter the IP address previously noted (see "7" above).

10 Quit the **System** menu and then press, in succession, **Expert Tools > Software Upgrade > From Ethernet**.

The message «Verify IP address of PC server» appears.

11 Click on **Continue**.

The list of the software versions available on the PC is displayed next to the versions installed on the 6000 Base Unit.


Version des logiciels
Boot V1.17 17/00/2005
Linux Kernel V1.45 09/01/2006
File System V1.45 09/01/2006
Fiber Optics V2.21 11/01/2006
Instrument Setup V2.21 11/01/2006
Microscope V2.10 03/06/2005
System Setup V2.21 09/01/2006
Version des logiciels de la mise à jour
Linux Kernel V1.44 25/11/2005
File System V1.44 25/11/2005
Fiber Optics V2.20 29/11/2005
Instrument Setup V2.20 28/11/2005
Microscope V2.10 03/06/2005
System Setup V2.20 28/11/2005

More recent version on the PC than on the 6000 Base Unit

Less recent version on the PC than on the 6000 Base Unit

Identical version on the PC and on the 6000 Base Unit

12 Click on **Previous choice** or **Next Choice** to display the previous and next versions available.

13 Click on **Confirm** to start the upgrade of the selected software(s).

Upgrading begins. The 6000 Base Unit is automatically rebooted. Upgrading takes several minutes. At the end, the 6000 Base Unit is automatically restarted.

1."N:" may be replaced by another letter if necessary and "6000_Base_Upgrade" corresponds to the directory where the updrade files have been unzipped.

14 On the PC, close the two windows opened to perform the installation.

15 Once the upgrade is completed, you may remove the virtual drive (in our example "N:") by using the command `subst N: /d`.

Installation from the CD-ROM drive of a PC

1 Connect the 6000 Base Unit into mains with the AC plug, and switch it on.

2 Connect the 6000 Base Unit to the PC by an Ethernet link

NOTE

Use a cross over if the 6000 Base Unit is directly connected to the PC or a direct cable if the 6000 Base Unit is connected to the LAN.

3 Insert the CD-ROM in the drive of the PC.

4 On the PC, use Windows Explorer to open the CD-ROM.

5 Run ***TFTPD32.exe***: note the «Server Interfaces» address which appears in the TFTPD32 window.

6 Run ***FTP server.exe***. An error message will appear: click on **OK**.

The window «Pablo's FTP server» is displayed. Click on the green arrow (or select menu File > Start).

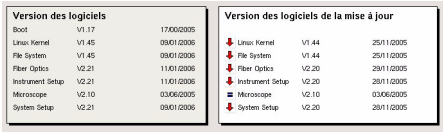
7 On the 6000 Base Unit, press the **SYSTEM** key, then **System Menu:** in **Utility > Upgrade Parameters > Server adress**, enter the IP address previously noted (see "5" above).

8 Quit the **SYSTEM** menu and then press, in succession, **Expert Tools > Software Upgrade > From Ethernet**.

The message Verify IP address of PC server appears.

9 Click on **Continue**.

The list of the software versions available on the PC is displayed next to the versions installed on the 6000 Base Unit.


Version des logiciels
Boot V1.17 17/00/2005
Linux Kernel V1.45 09/01/2006
File System V1.45 09/01/2006
Fiber Optics V2.21 11/01/2006
Instrument Setup V2.21 11/01/2006
Microscope V2.10 03/06/2005
System Setup V2.21 09/01/2006
Version des logiciels de la mise à jour
Linux Kernel V1.44 25/11/2005
File System V1.44 25/11/2005
Fiber Optics V2.20 29/11/2005
Instrument Setup V2.20 28/11/2005
Microscope V2.10 03/06/2005
System Setup V2.20 28/11/2005

More recent version on the PC than on the 6000 Base Unit

Less recent version on the PC than on the 6000 Base Unit

Identical version on the PC and on the 6000 Base Unit

10 Click on **Previous choice** or **Next Choice** to display the previous and next versions available.

11 Click on **Confirm** to start the upgrade of the selected software(s).

Upgrading begins. The 6000 Base Unit is automatically rebooted. Upgrading takes several minutes. At the end, the 6000 Base Unit is automatically restarted.

12 On the PC, close the two windows opened to perform the installation.

Installation from a USB memory stick

You must be equipped with a USB memory stick with a minimum capacity of 128 Mo.

Only one USB memory key should be plugged in the unit at any one time.

If you wish to use a second USB key (even if it is from the same manufacturer), then you must fully reboot the unit. (i.e. power down and remove external power if it was present).

Before installing the upgrade, you must format the USB memory stick (steps 1 to 5).

1 Insert the memory stick into one of the sockets on the 6000 Base Unit provided for this purpose.

2 Switch on the 6000 Base Unit

3 Press the **SYSTEM** button

4 Successively select **Expert tools** > **Media utilities** > **Usbflash Format.**

5 Confirm your choice to actually format the USB memory stick.

As for any media formatting, please note that all data present on the USB memory stick will be irremediably lost.

6 Connect the USB memory stick to the PC

7 Unzip the upgrade files on the PC and transfer it to the USB memory stick.

8 Insert the memory stick, into one of the sockets on the 6000 Base Unit provided for this purpose.

NOTE

A bip is emitted each time the USB memory stick is inserted or removed from the 6000 Base Unit (future function).

9 Press the **SYSTEM** button, then successively the buttons **Expert tools > Software Upgrade > Copy from USB**.

The message Are you sure? is displayed

10 Click on **Confirm**.

The list of the software versions available on the USB memory stick is displayed next to the versions installed on the 6000 Base Unit.

11 Click on **Previous choice** or **Next Choice** to display the previous and next versions available.

12 Click on **Confirm** to start the upgrade of the selected software(s). Remove the key and insert it again when requested.

Upgrading begins. The 6000 Base Unit is automatically rebooted. Upgrading takes several minutes. At the end, the 6000 Base Unit is automatically restarted.

Replacement of the small PCB battery (for backup)

The 6000 Base Unit Lithium battery on the microprocessor board ensures that date, time and certain information data are not lost when the instrument is switched off.

Checking the battery

If there is doubt as to whether the battery needs to be changed or not, switch off the instrument. On switching the instrument on again, check whether the date is still correct. If the date has been lost, the battery needs replacing.

Contact your nearest JDSU Customer Service Centre.

This battery has an average life of more than five years.

Battery replacement should not be carried out by the user: this may be dangerous to the microprocessor board (certain components may be damaged or destroyed) and requires special tools

General information on warranty

The warranties described herein shall apply to all commercially available JDSU products. Any additional or different warranties shall apply only if agreed to by JDSU in writing. These warranties are not transferable without the express written consent of JDSU.

Hardware Warranty

JDSU warrants that Hardware Product sold to customer shall, under normal use and service, be free from defects in materials and workmanship. Information regarding the specific warranty period for this product can be obtained by contacting your local Acterna Customer Service Representative, or at our web site ***www.acterna.com***.

JDSU ’s obligation and customer’s sole remedy under this Hardware Warranty is limited to the repair or replacement, at Acterna’s option, of the defective product. JDSU shall have no obligation to remedy any such defect if it can be shown: (a) that the Product was altered, repaired, or reworked by any party other than JDSU without JDSU’s written consent; (b) that such defects were the result of customer’s improper storage, mishandling, abuse, or misuse of Product; (c) that such defects were the result of customer’s use of Product in conjunction with equipment electronically or mechanically incompatible or of an inferior quality; or (d) that the defect was the result of damage by fire, explosion, power failure, or any act of nature.

JDSU performed repairs shall be warranted from defective material and workmanship for a period of ninety (90) days, or until the end of the Initial Warranty Period, whichever is longer. Risk of loss or damage to Product returned to JDSU for repair or replacement shall be borne by customer until delivery to JDSU.

Upon delivery of such product, Acterna shall assume the risk of loss or damage until that time that the product being repaired or replaced is returned and delivered to customer. Customer shall pay all transportation costs for equipment or software shipped to JDSU for repair or replacement. JDSU shall pay all transportation costs associated with returning repaired or replaced product to customer.

WARRANTY DISCLAIMER — FOR HARDWARE AND/OR SERVICES FURNISHED BY JDSU, THE FOREGOING

WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTEES AND CONDITIONS, EXPRESS OR IMPLIED. JDSU SPECIFICALLY

DISCLAIMS ALL OTHER WARRANTIES, EITHER EXPRESS OR IMPLIED, ON ANY HARDWARE, DOCUMENTATION

OR SERVICES INCLUDING BUT NOT LIMITED TO WARRANTIES RELATING TO QUALITY, PERFORMANCE, NONINFRINGEMENT,

MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AS WELL AS THOSE ARISING FROM ANY COURSE OF DEALING,

USAGE OR TRADE PRACTICE. UNDER NO CIRCUMSTANCES WILL ACTERNA BE LIABLE FOR ANY INDIRECT OR CONSEQUENTIAL

DAMAGES RELATED TO BREACH OF THIS WARRANTY.

Touchscreen calibration

If the 6000 Base Unit is equipped with a touchscreen, a specific button **Touchscreen Calibration** appears in the right hand corner of the setup screen.

To calibrate the touchscreen

1. Push the **SYSTEM** button
2. Press the **System Setup** key

3 Press the **Touchscreen Calibration** key

A grey slightly smaller screen appears, displaying a little target on the left hand corner.

4 Click on this target (preferably with the touchscreen pen).

5 A new target appears then and again for a total of 4 times, in order to click on all corners of the screen.

If all the targets are not correctly touched, a message appears indicating that the touchscreen has not been successfully configured.

Otherwise, the touchscreen may be used directly.

Technical specifications

10

This chapter contains the technical specifications of the 6000 Base Unit mainframe.

The topics discussed in this chapter are as follows:

– “Display” on page 100
– “Memory” on page 100
– “Input/Output” on page 100
– “Power supply” on page 100
– “Dimensions - Weight” on page 101
– “Environment” on page 102
– “Characteristics of the options” on page 103

Display

Screen

– Back-light color screen
– Size: 8.4 inch
– Resolution: 800 x 600 pixels
– Standard: high visibility screen, non-tactile.
– Options:
• High visibility touchscreen

Memory

– Standard memory: internal Flash memory, minimum capacity 256 Mbytes (of which 32 Mbytes are available for data storage)
– Options:
- Internal extended memory, minimum capacity 1 Gbytes

Input/Output

– two USB 1.1 Master ports, for printer, mouse, keyboard, memory stick, optical microscope, etc.
– one RJ 45 connector for Ethernet interface 10/100 Mbit/s
– built-in microphone and loudspeaker

Power supply

Battery The instrument can be supplied with one Lithium Ion battery or nickel-metal hybride (NiMH) battery.

Endurance of the 6000 Base Unit with one lithium ion battery

Measurement conditions:

- at +25 °C,
- at nominal capacity (6 Ah),
- 6000 Base Unit equipped with an OTDR plug-in, type SR

Endurance

– Test carried out in accordance with Telcordia GR-196-CORE recommendations: lighter backlight for the screen, (3 acquisitions of 30s per 15 minutes and auto-off): up to 11 hours

– With continuous acquisition:
  - up to 5 hours with normal screen lighting.
  - up to 3.5 hours with strong screen lighting.

Mains adapters

	Standard Mains Adapter
Input	100-240 V, 50-60 Hz
Output	19 V continuous, 3,16 A max
Compliance	EN 60950

Dimensions - Weight

Dimension

- l x h x W = 285 x 195 x 93 mm (11.2 x 7.7 x 3.7 inches)

Weight

- 2.4 kg (5.3 lbs) without battery and module.

- 3.4 kg (7.5 lbs) with battery and module.

Environment

Temperature

- Operation on mains supply, excluding options: -20°C to +50°C.
- Operation including all options (guaranteed specifications): 0° to +40° C
- Storage: -20°C to +60°C

Humidity

- 5 to 95% without condensation

EMI/ESD

- CE class A Compliant
- FCC 47-1 Part 15 Compliant

This is a class A product. In a domestic environnment, this product may cause radio interference in which case the user may be required to take adequate measures.

Drop test In accordance with the Telcordia GR-196-CORE recommendations, the 6000 Base Unit resists the following test:

- 6 impacts dropped from a height of 76 cm (1 impact on each of its 6 sides, with power off).

Shocks The 6000 Base Unit resists the following test:

- 3 shocks per axis along each of the 3 axes, with power off.
- Impacts of 15g, 1/2 sine, duration 11 ms, at 10 second intervals.

Bumps The 6000 Base Unit resists the following test:

- 1,000 jolts per axis along each of the 3 axes, with power off.
- Jolts of 15g, 1/2 sine, duration 6 ms, at 1 second intervals.

Vibration

The 6000 Base Unit resists the following vibration tests:

- Complete test comprising 6 cycles along each of the x, y and z axes.
- One cycle of 5 to 200 Hz and back to 5 Hz with a sweep duration of one minute/octave.
- 3 mm amplitude displacement test, for the range 5 Hz to 15 Hz.
- 3g acceleration test for the range 16 Hz to 200 Hz.

Flammability

The housing of the 6000 Base Unit (in ABS, type V0) does not propagate fire.

Characteristics of the options

Power meter of the LTS option

Specifications given for 25°C, after 20 minutes stabilization time and after zero setting.

- Wavelength range: 800 to 1650 nm in steps of 1 nm
- Calibrated wavelengths: 850 / 1310 / 1550 nm
- Accuracy at calibrated wavelengths: ± 0.2 dB (at -30 dBm)
- Input power range: +10 dBm to -60 dBm
- Maximum resolution: 0.01 dB / 0.01n W
- Measurement range:+5 to -50 dBm (-45 dBm from 800 to 1250 nm)
- Linearity within the measurement range: ± 0.2 dB

Talkset

- Dynamic range: typically 45 dB at 25°C.
- Jack socket for headset
- Laser, typical wavelength 1550 nm, class 1 (EN60825 and FDA21 CFR Part 1040.10)

Laser sources of the LTS option

Laser

Class 1

– Wavelength laser at 25°C:

1310 ± 30 nm

1550 ± 30 nm

1625 ± 10 nm

– Spectral bandwidth: 5 nm RMS maximum

Output level

– -3.5 dBm
– modulated mean level -6.5 dBm
– Stability[1]:

± 0.02 dB, short term (15 minutes) for temperature differences of ± 0.3° K

± 0.2 dB, long term (8 hours) for temperature differences of ± 3° K

Emission mode

– Continuous signal (CW)
– Signal including lambda information for the power meter (Auto-λ).
– Modulated signal to identify the fiber (at 270, 330, 1k or 2kHz).
– Wavelengths activated one after the other (TwinTest mode).

VFL

– Wavelength: 635 nm
– Length of fiber: up to 5 km
– Class 2 laser (standards EN60825 and FDA21 CFR Part 1040.10).

1.The specifications concerning accuracy and stability do not become valid until 20 minutes after switching on, and are only valid with a proper fiber connection.

Options and accessories

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This chapter shows the references of the options and accessories of the 6000 Base Unit.

The topics discussed in this chapter are as follows:

– “References of options for the 6000 Base Unit mainframe” on page 106
– “References of result processing software” on page 108
– “References of scopes and associated accessories” on page 108
– “References of accessories” on page 110

References of options for the 6000 Base Unit mainframe[1]

	Reference
Options	
Instrument with high visibility screen and battery.	EM6000 ETB6000 (US)
Instrument with high visibility touchscreen and battery.	EM6000T ETB6000T (US)
Memory options	**Reference**
Internal extended memory, min. cap.1 Gbytes.	E60EXTMEM
Mains options	**Reference**
Mains adapter/charger (USA)	E80PWUS
Mains adapter/charger (UK)	E80PWUK
Mains adapter/charger (Europe)	E80PWE
Mains adapter/charger (Australia)	E80PWAUS
High Power mains adapter/charger for cigar lighter	E80lighter
Talkset [a]/ LTS (Light source and/or Power meter) options	**Reference**
Talkset	E80TS
Power meter with UPP 2.5 mm connector	E80PM
Talk set + LTS source 1310/1550 + powermeter	E8026LTSTS
Talk set + LTS source 1550/1625 + powermeter	E8029LTSTS
Talk set + LTS source 1310/1550/1625 + powermeter	E8036LTSTS
Talk set + LTS source 1550 + powermeter	E8025LS/PM
VFL with UPP connector	E80VFL
Universal connectors for Talkset [b]	
Universal PC connector with FC adapter	EUNIPCFC
Universal PC connector with SC adapter	EUNIPCSC
Universal PC connector with ST adapter	EUNIPCST

1.These options must be ordered together with the instrument.

	Reference
Universal PC connector with DIN adapter	EUNIPCDIN
Universal APC connector with FC adapter	EUNIAPCFC
Universal APC connector with SC adapter	EUNIAPCSC
Universal APC connector with ST adapter	EUNIAPCST
Universal APC connector with DIN adapter	EUNIAPCDIN
Extra adapter for talkset [c]	
Universal FC adapter	EUFCAD
Universal SC adapter	EUSCAD
Universal ST adapter	EUSTAD
Universal DIN adapter	EUDINAD
Connector for VFL and power meter	
Universal push/pull connector/adapter, 2.5 mm fiber	EUPP2.5

a. Type of connector to be specified on order
b. At least one connector must be chosen
c. Interchangeable in the field

References of result processing software[2]

Optical Fiber Trace software	EOFS100
Optical Fiber Trace software (5 licences)	EOFS1005L
Optical Fiber Trace software (site licence)	EOFS100SL
FiberTrace software - update	EOFS100UP
Optical Fiber Cable software	EOFS200
Optical Fiber Cable software (5 licences)	EOFS2005L
Optical Fiber Cable software (site licence)	EOFS200SL

References of scopes and associated accessories

(Scopes, connectors and associated accessories

Optical Fiber Microscope 250x through USB	EFSCOPE250
Optical Fiber Microscope 400x through USB	EFSCOPE400
Optical Fiber Microscope 250x with Video Display	EFSCOP25VD
Optical Fiber Microscope 400x with Video Display	EFSCOP40VD
Additional Hand Held Video Display	EFSCOPEVD
Carrying case for fiber microscope and accessories	EFSCOPESC1
Standard additional AC/DC adapter/charger (US)	EVDPWRUS
Standard additional AC/DC adapter/charger (Europe)	EVDPWREU
Standard additional AC/DC adapter/charger (UK)	EVDPWRUK
Universal patchcord tip for 2.5mm ferrule	TIPU25MM
Universal patchcord tip for 1.25mm ferrule	TIPU125MM

2.Free software updates on the Web (but without user manual)

FC/PC tip for bulkhead adapters	TIPFC
FC/APC tip for bulkhead adapters	TIPFC/APC
SC/PC tip for bulkhead adapters	TIPSC
SC/APC tip for bulkhead adapters	TIPSC/APC
ST/PC tip for bulkhead adapters	TIPST/PC
LC tip for bulkhead adapters	TIPLC
E2000 tip for bulkhead adapters	TIPE2000
MU tip for bulkhead adapters	TIPMU

References of accessories

Soft and hard carrying cases	**Reference**
Soft carrying case for 6000 Base Unit	ESCASE4
Soft carrying case for 6000 Base Unit with strap	ESCASE5
Hard carrying case with wheels	EHCASE6
Keyboard/Mouse	
USB mouse	E80mouse
USB QWERTY keyboard	E80keyB

User manual for 6000 Base Unit platform	**Reference**
User manual for 6000 Base Unit platform (French)	E6000M01
User manual for 6000 Base Unit platform (English)	E6000M02
User manual for 6000 Base Unit platform (German)	E6000M03

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North America	Latin America	Asia Pacific	EMEA	www.jdsu.com
Toll Free: 1 800 638 2049 Tel: +1 240 404 2999 Fax:+1 240 404 2195	Tel: +55 11 5503 3800 Fax:+55 11 5505 1598	Tel: +852 2892 0990 Fax:+852 2892 0770	Tel: +49 7121 86 2222 Fax:+49 7121 86 1222	

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